

The following catalog  
has gaps in its page  
numbers, or doesn't  
have any numbers.  
We have chosen to  
leave the page  
numbering in the  
order that Acrobat  
assigns it.

**McGRAW-EDISON**

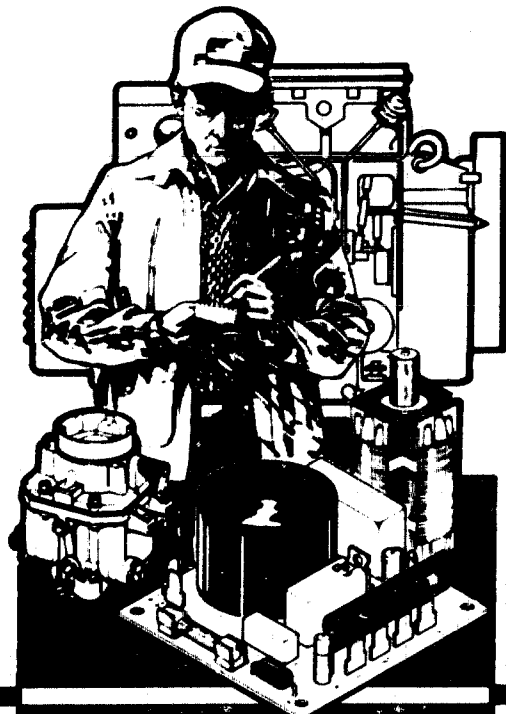
---

**Onan**

# **Parts Manual**

**WA**

**GenSet**



**Onan Service Parts**

---

947-0220  
4-83 (Specs F-L)  
Printed in U.S.A.

# GENERAL INFORMATION

## INSTRUCTIONS FOR ORDERING REPAIR PARTS

For parts or service, contact the dealer from whom you purchased this equipment or refer to your Nearest Authorized Onan Parts and Service Center.

To avoid errors or delay in filling your parts order, please furnish all information requested.

Always refer to the nameplate on your unit.

1. Always give the MODEL, SPEC NO. and SERIAL NO.

**McGRAW-EDISON**

**Onan**

**MODEL AND SPEC NO.**

**SERIAL NO.**

M-1149

For handy reference, insert "YOUR" nameplate information in the spaces above.

2. Do not order by reference number; always use part number and description.
3. Give the part number, description and quantity needed of each item. If an older part cannot be identified, return the part prepaid to your dealer or nearest Onan Parts and Service Center. Print your name and address plainly on the package. Write a letter to the same address stating the reason for returning the part.
4. State definite shipping instructions. Any claim for loss or damage to your unit in transit should be filed promptly against the transportation company making the delivery. Shipments are complete unless the packing list indicates items are back ordered.

Prices are purposely omitted from this Parts Manual due to the confusion resulting from fluctuating costs, import duties, sales taxes, exchange rates, etc.

For current parts prices, consult your Onan Dealer, Distributor or Parts and Service Center.

"En esta lista de partes los precios se omiten de proposito, ya que bastante confusion resulto de fluctuaciones de los precios, derechos aduanales, impuestos de venta, cambios extrajeros, etc."

Consiga los precios vigentes de su distribuidor de productos "ONAN."

# INDEX

	LOCATION
<b>GENERAL INFORMATION</b>	<b>A2</b>
<b>SET DATA TABLE</b>	<b>A4</b>
<b>REPLACEMENT ENGINE</b>	<b>A5</b>
<b>EQUIPMENT PARTS SECTION</b>	
Air Cleaner	A6
Alternator	A7
Anti-Dieseling System (Spec F)	A9
Chassis	B14
Control, Engine	B2
Control, Generator	B4
Cooling System with Radiator	A10
Current Transformer Assembly	B13
Engine Parts, Miscellaneous	A12
Battery Cables	
Engine Coolant Temperature Sender	
High Coolant Temperature Switches (Alarm & Shutdown)	
Low Engine Temperature Switch	
Low Oil Pressure Switch	
Oil Drain Hardware	
Oil Pressure Sender	
Oil Temperature Sender	
Wiring Harness	
Fuel System - Gasoline	A8
Ignition System	A14
Generator Assembly - Brushless Type with Integral Voltage Regulator	B6
Generator Assembly - Brushless Type with Remote Voltage Regulator	B8
Housing, Control	B1
Regulator, Voltage - End Bell Mounted (For Brushless Generators)	B10
Rotor, Exciter	B12
<b>OPTIONAL EQUIPMENT SECTION</b>	
Capacitor Assembly (Used with Switching Voltage Regulator)	* C8
Circuit Breaker	C2
Control, Engine (With Five Fault Lights)	C4
Control, Engine (With Mechanical Gauges)	C9
Control, Generator (With Switching Regulator)	C6
Cooling System with Heat Exchanger	C10
Cooling System with Standpipe	C12
Exhaust System (Housed Sets)	D2
Filter, Engine Coolant	F8
Filter, Voltage Regulator	D4
Fuel System - Dual (Gasoline & Nat. Gas) Spec F	D5
Fuel System - Dual (Gasoline & Nat. Gas) Begin Spec G	D6
Fuel System - Dual (Gasoline & LPG Vapor)	D8
Fuel System - Dual (Nat. Gas & LPG Liquid)	D10
Fuel System - Dual (Nat. Gas & LPG Vapor)	D12
Fuel System (LPG Liquid)	E2
Fuel System (LPG Vapor)	E1
Fuel System (Nat. Gas)	D14
Heater, Control	C14
Heater, Engine Coolant (Vertical Tank)	E4
Heater, Generator	D1
Housing, Set	E6
Switch, Low Coolant Level	E11
Tachometer	C4
Vernier Throttle	E9
Wattmeter	E10

This parts catalog applies to the standard generator sets listed below. Any engine parts modified or added by Onan will be listed in this catalog and have been assigned Onan part numbers for identification. These modified or added parts supersede similar parts listed in the Engine Manufacturer's manuals. The illustrations are arranged in groups of related items, and each part or assembly is identified by a reference number. All parts illustrated are typical, and unless otherwise mentioned, parts are interchangeable. These typical illustrations are subject to change and reflect only the latest replacement parts arrangement. The Right and Left generator set sides are determined by facing the front end of the engine.

### SET DATA TABLE

MODEL IDENTIFICATION	RATING	MODEL IDENTIFICATION	RATING
95.0 WA-*/#£	95,000 WATTS	115.0 WA-*/#£	115,000 WATTS
100.0 WA-*/#£	100,000 WATTS		

### ELECTRICAL DATA TABLE

*VOLTAGE CODES	VOLTS	HERTZ	WIRE	PHASE	NOTES
3	120/240	60	3	1	
6D	240/480	60	4	3	
7	220/380	60	4	3	
9X	347/600	60	4	3	
15	120/240	60	12	1	•
15	120/208	60	12	3	•
	120/240				
	127/220				
	139/240				
	240/416				
	254/440				
	277/480				
515	110/220	50	12	1	•
	115/230				
515	110/190	50	12	3	•
	110/220				
	115/200				
	115/230				
	120/208				
	127/220				
	220/380				
	230/400				
	240/416				
	254/440				
3R50	@	60	3	1	@
15R50	@	60	12	3	@*

- \* - Voltage codes follow model letters designations.
- # - Specification number, number 1 is standard, all others indicate variations
- £ - Specification letter, letter advances (A to B, B to C, etc.) with major manufacturing changes
- - These generators are reconnectible, refer to Operator's manual for wiring data
- @ - These are Penn State Sets, special parts are identified in the Parts Manual when applicable

### NOTICE!

ITEMS REFERENCED AS **OPTIONAL** INDICATE PART IS FACTORY INSTALLED AND MAY NOT BE APPLICABLE TO ALL MODELS. FOR FIELD CONVERSIONS ADDITIONAL PARTS ARE USUALLY REQUIRED.

## REPLACEMENT ENGINE

### ONAN PART NO.

100-0999

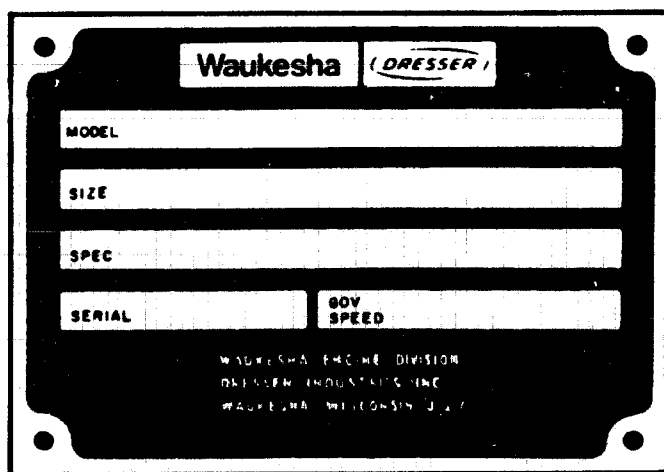
#### \*Engine, Replacement

Standard (Gasoline Fueled)

**Includes:** Complete Cylinder Block, Oil Pan, Water Pump, Oil Filter, Spark Plugs, Thermostat, Carburetor, Fuel Pump, Fan Blades & Belts.

**Excludes:** Air Cleaner, Generator, Oil Pressure, Water Temperature Gauge Senders, Oil Pressure Switch, High Water Temperature Cut Off Switch, Radiator, Muffler, Exhaust Tube, Fly Wheel, and Starter.

**\*NOTE:** Engine listed is for Standard Spec 1 (Radiator Cooled) generator sets, for all other models refer to the factory.



A rectangular nameplate form with a black background and white text. At the top, it features the 'Waukesha' logo and the 'DRESSER' logo. Below these are four horizontal white bars for labeling: 'MODEL', 'SIZE', 'SPEC', and 'SERIAL'. To the right of the 'SERIAL' bar is a smaller box labeled 'RPM SPEED'. At the bottom of the form, there is a block of text: 'WAUKESHA ENGINE DIVISION', 'DRESSER INDUSTRIES INC', and 'WAUKESHA, WISCONSIN 53181'.

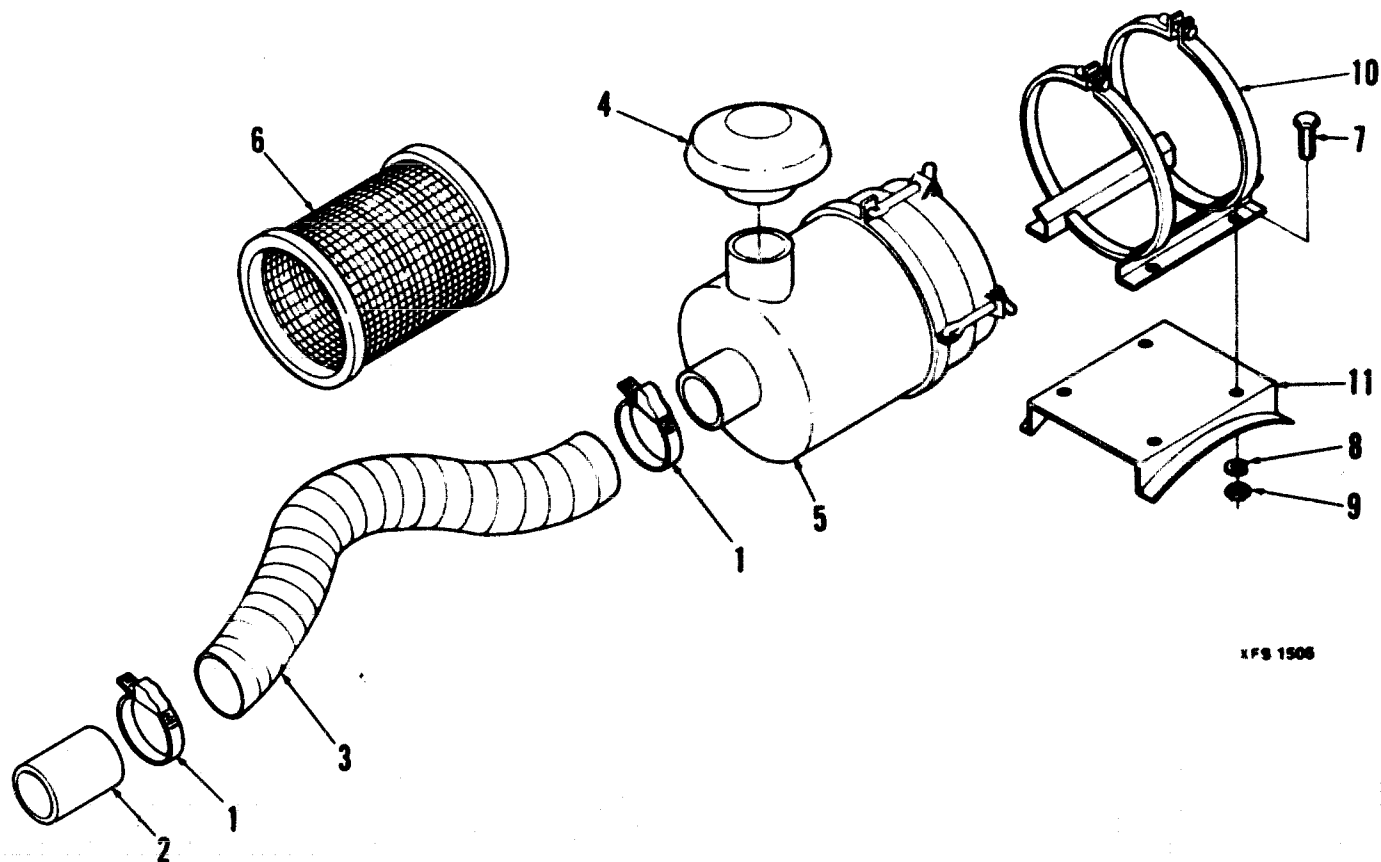
M 1482

For handy reference, insert "YOUR" nameplate information in the spaces.

## ENGINE REPLACEMENT PARTS

All engine replacement parts must be ordered from the engine manufacturer, except those modified or added by Onan. When ordering engine parts, refer to the manufacturer's nameplate and supply the Model, Spec, Serial numbers and other available information. Refer to the engine manufacturer's manuals for your nearest authorized distributor or parts center; or contact the Onan distributor whom you purchased this set for assistance in ordering replacement parts.

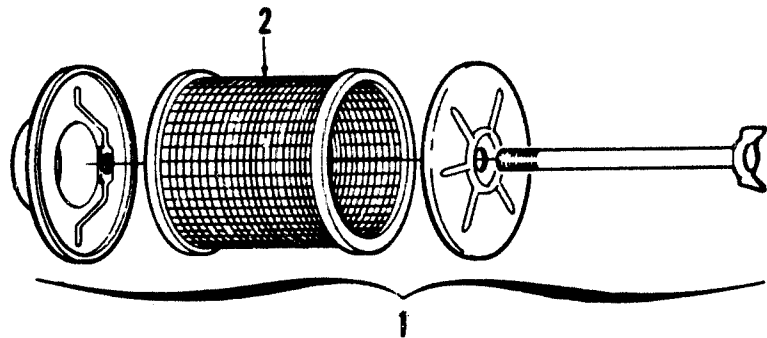
# **AIR CLEANER (SPEC F ONLY)**



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	503-0621	2	Clamp, Hose
2	503-0597	1	Hose, Rubber (2-7/8"ID x 3-1/2"OD x 3"Lg)
3		1	Hose, Rubber - Flexible (3-1/2"ID x 48"Lg)
4	140-1127	1	Hood, Air Cleaner
5	140-1128	1	Air Cleaner Assembly (Includes Element)

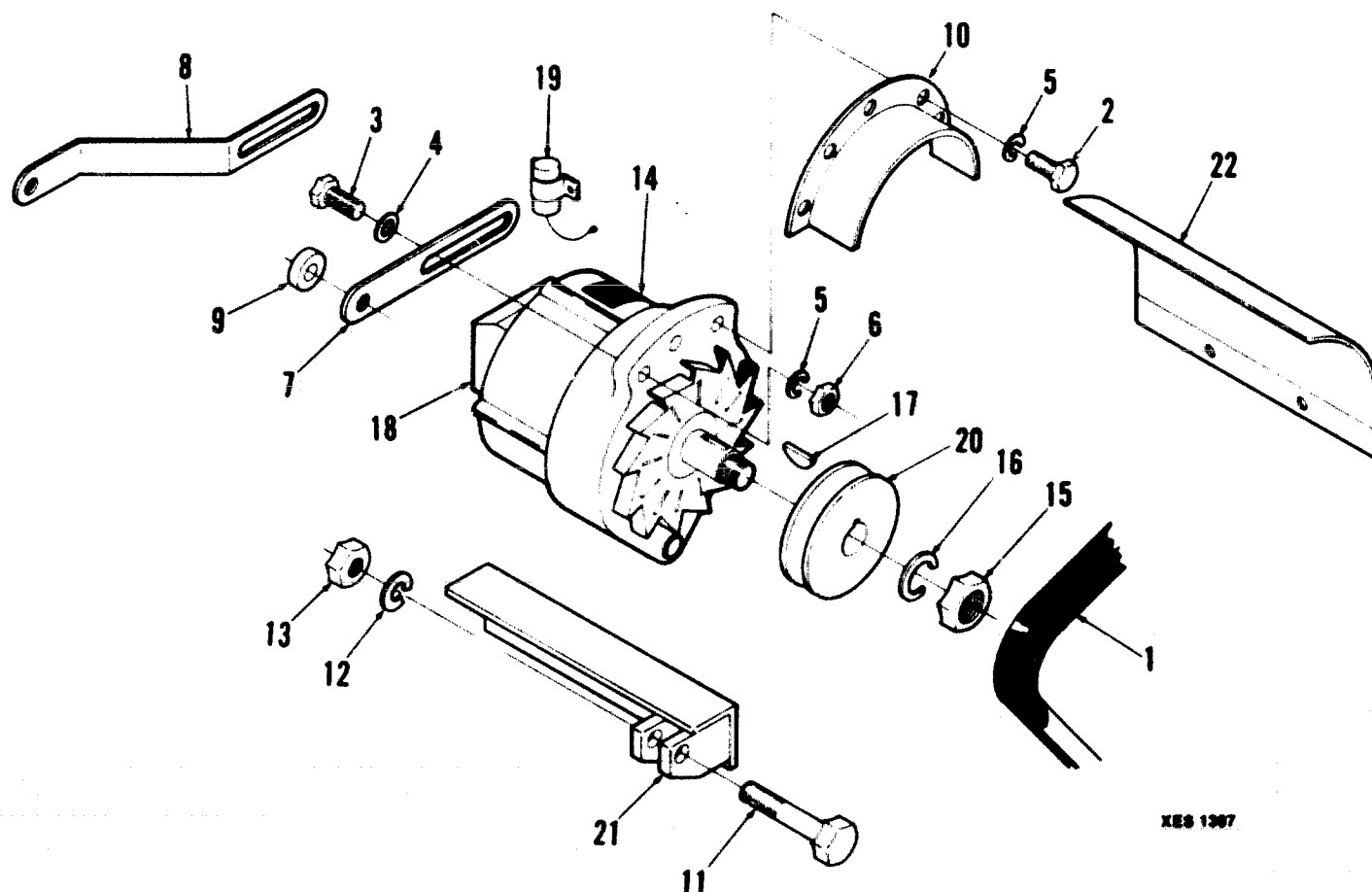
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
6	140-1155	1	Element, Air Cleaner
7	800-0026	4	Screw, Cap - Hex Head (5/16-18 x 3/4")
8	850-0045	4	Washer, Lock - Spring (5/16")
9	862-0015	4	Nut, Hex (5/16-18)
10	140-1129	1	Clamp Assembly - Air Cleaner Mounting
11	140-1125	1	Plate, Mounting - Air Cleaner

# **AIR CLEANER (BEGIN SPEC G)**



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	140-0851	1	Air Cleaner Assembly (Includes Element)
2	140-0871	1	Element, Air Cleaner

# ALTERNATOR



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	511-0094	1	Belt, Drive
2	821-0014	1	Screw, Self-locking - Hex Head (5/16-18 x 1/2")
3	800-0030	1	Screw, Cap - Hex Head (5/16-18 x 1-1/4")
4	526-0030	1	Washer, Flat (13/32" ID x 7/8" OD x 1/8" Thk)
5	850-0045	2	Washer, Lock - Spring (5/16")
6	862-0015	1	Nut, Hex (5/16-18)
7	191-0869	1	Bracket, Adjusting - Alternator (Used Beginning 1980)
8	191-0851	1	Bracket, Adjusting - Alternator (Used up thru 1979)
9	526-0211	1	Spacer
10	191-0725	1	Guard, Belt
11	800-0095	1	Screw, Cap - Hex Head (1/2-13 x 2-1/4")

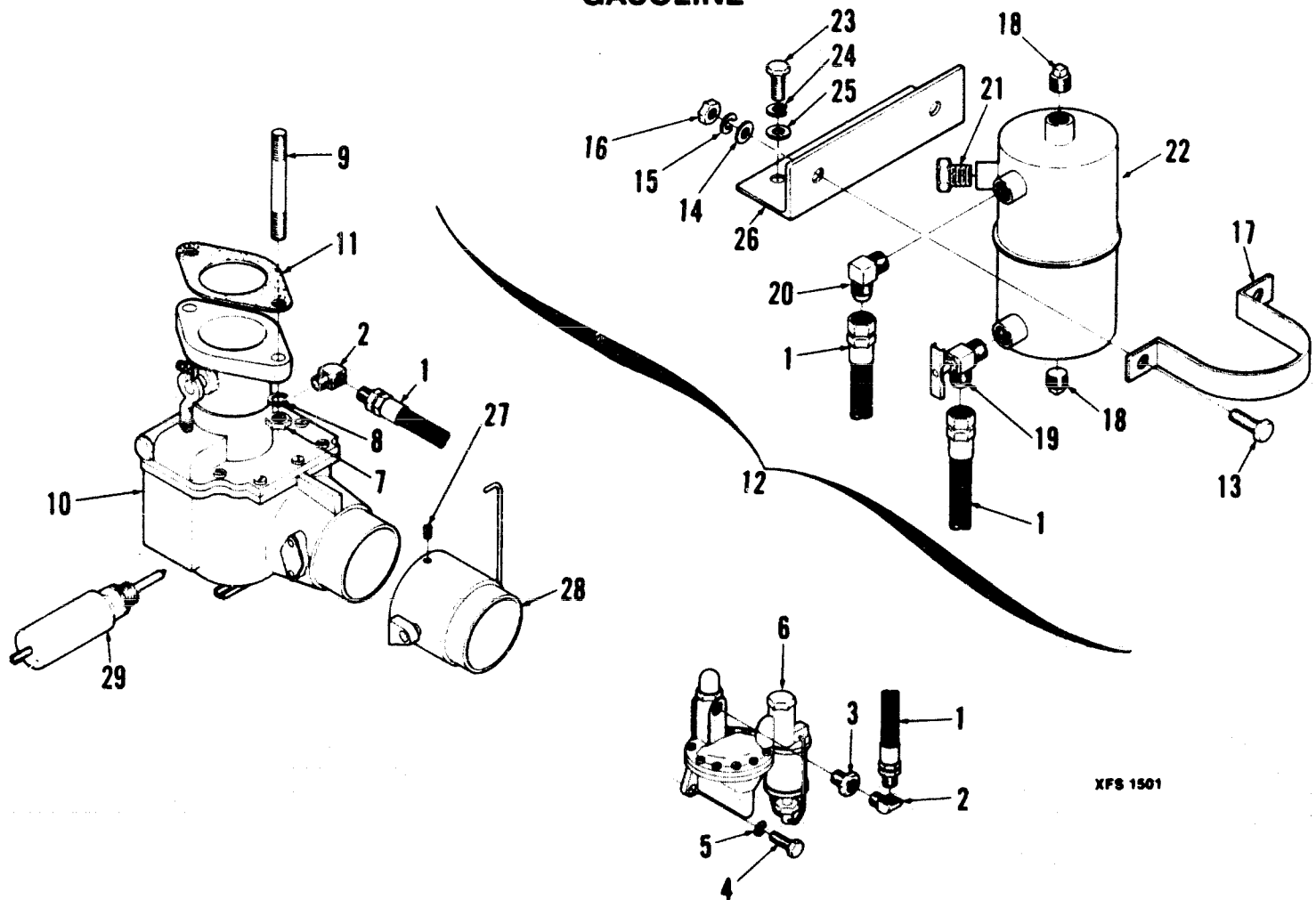
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
12	850-0060	1	Washer, Lock - Spring (1/2")
13	862-0016	1	Nut, Hex (1/2-13)
14	ALTERNATOR (Includes Parts Marked £) 191-1388	1	12 VDC (A Replacement Kit, Includes Part Marked *)
15	868-0007	1	£Nut, Hex (5/8-18)
16	850-0070	1	£Washer, Lock - Spring (5/8")
17	515-0093	1	£Key, Woodruff (#5)
18	191-1390	1	£Regulator, Voltage (A Replacement Kit, Includes Part Marked *)
19	312-0201	1	*Capacitor (Replacement Alternator and Regulator Applications)
20	191-0649	1	Pulley
21	191-0870	1	Bracket, Mounting
22	155-0922	1	Heatshield

£ - Parts included with Alternator

\* - Part included in replacement Kits.



## FUEL SYSTEM — GASOLINE

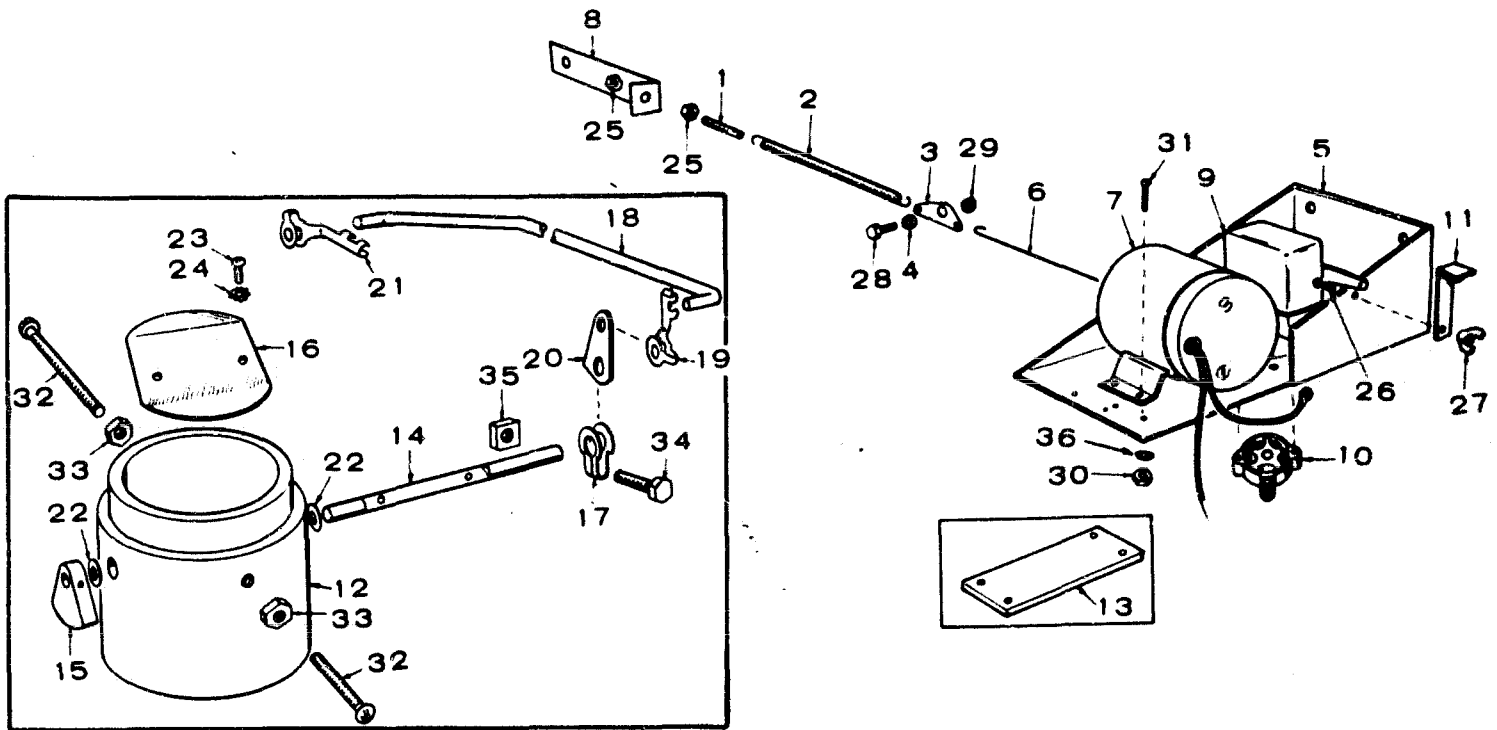


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	501-0085	2	Line, Fuel - Flexible (1/4-18 NPT Male x 3/8-18 45DEG Female Swivel x 36"Lg)
2	502-0054	2	Elbow, Pipe (1/4"NPT x 1/4"NPT)
3	505-0017	1	Bushing, Reducer - Hex (3/8"NPT x 1/4"NPT)
4	800-0028	2	Screw, Cap - Hex Head (5/6-18 x 1")
5	850-0045	2	Washer, Lock - Spring (5/16")
6	#	1	Pump, Fuel
7	110-0067	2	Nut, Hex (7/16-20)
8	850-0055	2	Washer, Lock - Spring (7/16")
9	#	2	Stud
10	#	1	Carburetor, Gasoline
11	#	1	Gasket
12	159-0672	1	Fuel Reservoir Assembly (Includes Items 13 thru 26)
13	800-0005	2	Screw, Cap - Hex Head (1/4-20 x 3/4")

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
14	526-0015	2	Washer, Flat (9/32"ID x 9/16"OD x 1/16"Thk)
15	850-0040	2	Washer, Lock - Spring (1/4")
16	862-0001	2	Nut, Hex (1/4-20)
17	159-0871	1	Band, Mounting - Tank
18	505-0057	2	Plug, Pipe - Square Head (1/8"NPT)
19	504-0059	1	Cock, Valve (1/4"NPT x 3/8"SAE Male)
20	502-0183	1	Elbow (1/4"NPT Male x 3/8"SAE Male)
21	159-0705	1	Bushing, Reducer - With Restriction Plug (1/8"NPT x 3/8"NPT)
22	159-0668	1	Tank, Fuel Reservoir
23	800-0090	2	Screw, Cap - Hex Head (1/2-13 x 1")
24	950-0060	2	Washer, Lock - Spring (1/2")
25	526-0035	2	Washer, Flat (7/32"ID x 7/8"OD x 1/8"Thk)
26	159-0985	1	Bracket, Mounting - Tank
27	803-0002	4	Setscrew (#8-32 x 3/16")
28	CHOKE ASSY - SPEC F ONLY (See Anti-Dieseling System for components)		
29	307-1458	1	Solenoid, Fuel Cutoff (12VDC)

# - For replacement refer to Engine Manufacturer

# **ANTI-DIESELING SYSTEM SPEC F ONLY**

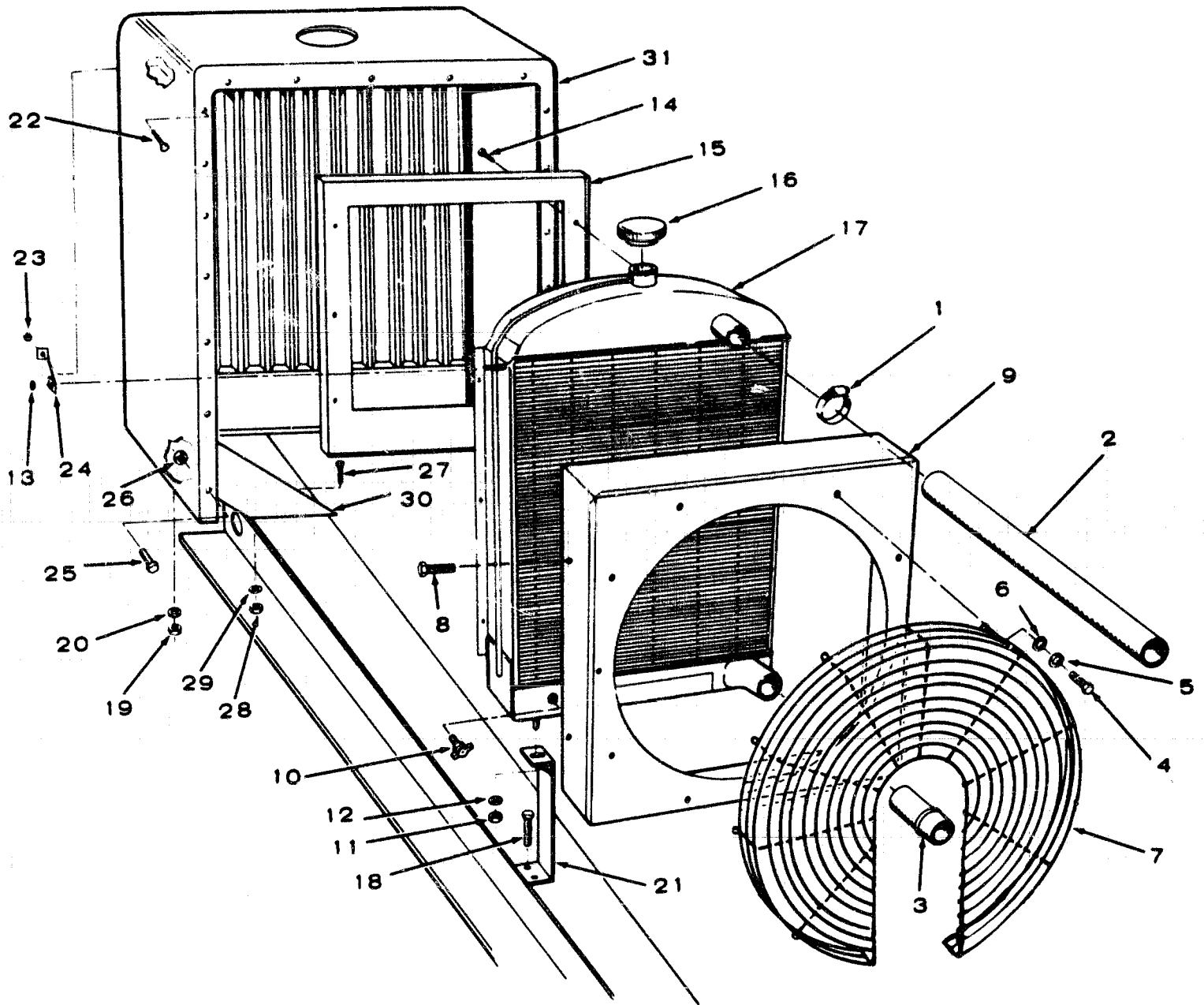


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	150-0146	1	Stud, Adjusting
2	145-0119	1	Spring, Throttle
3	145-0414	1	Link, Throttle Spring
4	150-0302	1	Spacer, Linkage
5	145-0418	1	Bracket, Solenoid and Choke Mounting
6	LINK, SOLENOID		
	145-0416	1	Gasoline Sets
	145-0415	1	Gas-Gasoline and LPG-Gasoline Sets
7	307-1093	1	Solenoid and Lead Assembly
8	145-0221	1	Bracket, Throttle Spring
9	153-0213	1	Choke, Automatic - Sisson (Gas-Gasoline & LPG-Gasoline Sets)
10	153-0049	1	Cover Assembly, Choke (Gas-Gasoline & LPG-Gasoline Sets)
11	153-0285	1	Arm, Choke Lock (Gas-Gasoline & LPG-Gasoline Sets)
12	153-0445	1	Adapter, Choke (Gas-Gasoline & LPG-Gasoline Sets)
13	145-0417	1	Spacer, Solenoid Mounting (Gasoline Sets)
14	153-0286	1	Shaft, Choke (Gas-Gasoline & LPG-Gasoline Sets)
15	148-0317	1	Counterweight, Choke Shaft (Gas-Gasoline and LPG-Gasoline Sets)
16	153-0206	1	Plate, Choke (Gas-Gasoline & LPG-Gasoline Sets)
17	153-0282	1	Arm, Choke (Gas-Gasoline and LPG-Gasoline Sets)
18	153-0284	1	Rod, Choke (Gas-Gasoline and LPG-Gasoline Sets)
19	518-0047	1	Clip, Rod End - Adapter End (Gas-Gasoline and LPG-Gasoline Sets)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
20	153-0283	1	Arm, Choke Over-Ride (Gas-Gasoline & LPG-Gasoline Sets)
21	518-0005	1	Clip, Rod End - Choke End (Gas-Gasoline and LPG-Gasoline Sets)
22	508-0007	2	Washer, Choke Shaft Seal (Gas-Gasoline & LPG-Gasoline Sets)
23	812-0059	2	Screw, Choke Plate Mounting (Gas-Gasoline & LPG-Gasoline Sets)
24	853-0003	2	Washer, Choke Plate Mounting (Gas-Gasoline & LPG-Gasoline Sets)
25	870-0053	2	Nut (10-32) - Adjusting Stud
26	813-0100	1	Screw (10-32 x 1/2) - Choke Lock Arm Mounting (Gas-Gasoline & LPG-Gasoline Sets)
27	865-0011	1	Nut (10-32), Wing - Choke Lock Arm Mounting (Gas-Gasoline & LPG-Gasoline Sets)
28	800-0005	1	Screw (1/4-20 x 3/4) - Throttle Spring Link
29	862-0001	1	Nut (1/4-20) - Throttle Spring Link
30	860-0008	4	Nut (8-32) - Solenoid Mounting
31	SCREW, SOLENOID MOUNTING		
	812-0082	4	(8-32 x 3/4") - Gasoline Sets
	812-0077	4	(8-32 x 3/8") - Gas-Gasoline and LPG-Gasoline Sets
32	SCREW, CHOKE PLATE STOP		
	812-0084	1	8-32 x 1"
	812-0089	1	8-32 x 2"
33	860-0009	2	Nut (8-32)
34	815-0178	1	Screw (10-32 x 5/8) - Choke Arm Mounting
35	861-0008	1	Nut, Hex (10-32) - Choke Arm Mounting
36	854-0007	4	Washer (#8), Shakeproof IT

£ - Solenoid no longer available - For replacement order kit #145-0481

## COOLING SYSTEM (WITH RADIATOR)

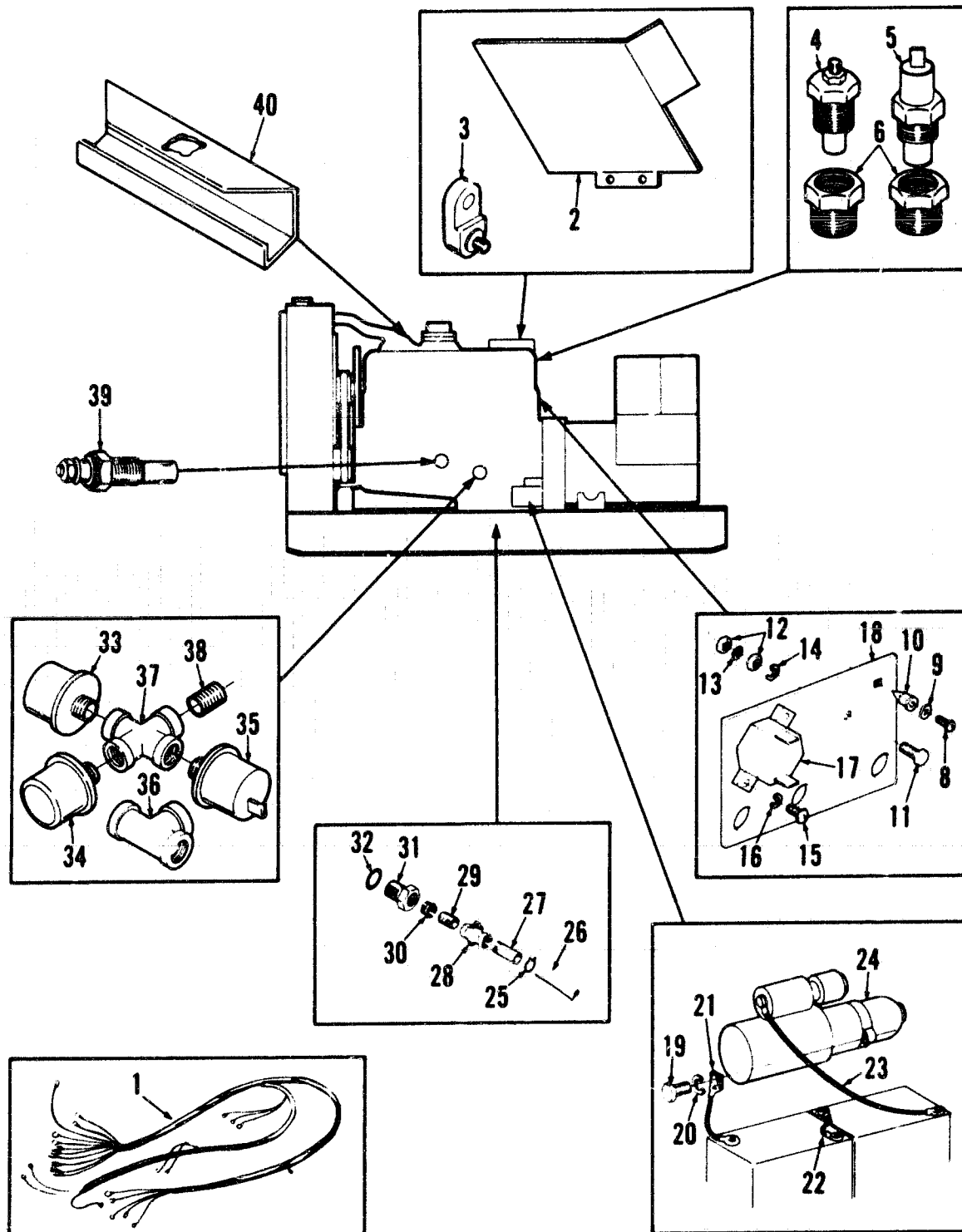


XCB-1053

## COOLING SYSTEM (WITH RADIATOR)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	503-0465	4	Clamp, Hose
2	503-0618	1	Hose, Rubber - Upper
3	503-0617	1	Hose, Rubber - Lower
4	800-0005	8	Screw, Cap - Hex Head (1/4-20 x 3/4")
5	850-0040	8	Washer, Lock - Spring (1/4")
6	526-0018	8	Washer, Flat (17/64" ID x 5/8" OD x 1/16" Thk)
7	130-0832	1	Guard, Fan
8	821-0014	6	Screw, Self-locking - Hex Washer Head (5/16-18 x 1/2")
9	130-0830	1	Shroud, Fan
10	504-0028	1	Cock, Drain
11	862-0016	2	Nut, Hex (1/2-13)
12	850-0060	2	Washer, Lock - Spring (1/2")
13	870-0257	2	Nut, Self-locking, Hex (5/16-18)
14	821-0010	6	Screw, Self-locking - Hex Washer Head (1/4-20 x 1/2")
15	130-0845	1	Shroud, Radiator
16	130-0449	1	Cap, Radiator
17	RADIATOR		
	130-0834	1	Sets with Dr. Manifold
	130-0838	1	Sets with V. Manifold Cooled Manifold
18	800-0092	4	Screw, Cap - Hex Head (1/2-13 x 1-1/2")
19	862-0016	4	Nut, Hex (1/2-13)
20	850-0060	4	Washer, Lock - Spring (1/2")
21	130-0844	2	Bracket, Support - Radiator
22	821-0016	2	Screw, Self-locking - Hex Washer Head (5/16-18 x 3/4")
23	870-0257	2	Nut, Self-locking, Hex (5/16-18)
24	130-0833	2	Brace, Support - Radiator
25	821-0016	4	Screw, Self-locking - Hex Washer Head (5/16-18 x 3/4")
26	870-0257	4	Nut, Self-locking, Hex (5/16-18)
27	800-0030	6	Screw, Cap - Hex Head (5/16-18 x 1-1/4")
28	862-0015	6	Nut, Hex (5/16-18)
29	850-0045	6	Washer, Lock - Spring (5/16")
30	405-2016	2	Bracket, Mounting - Front Panel
31	405-1865	1	Panel, Housing - Front

# MISCELLANEOUS ENGINE PARTS



XM 1504

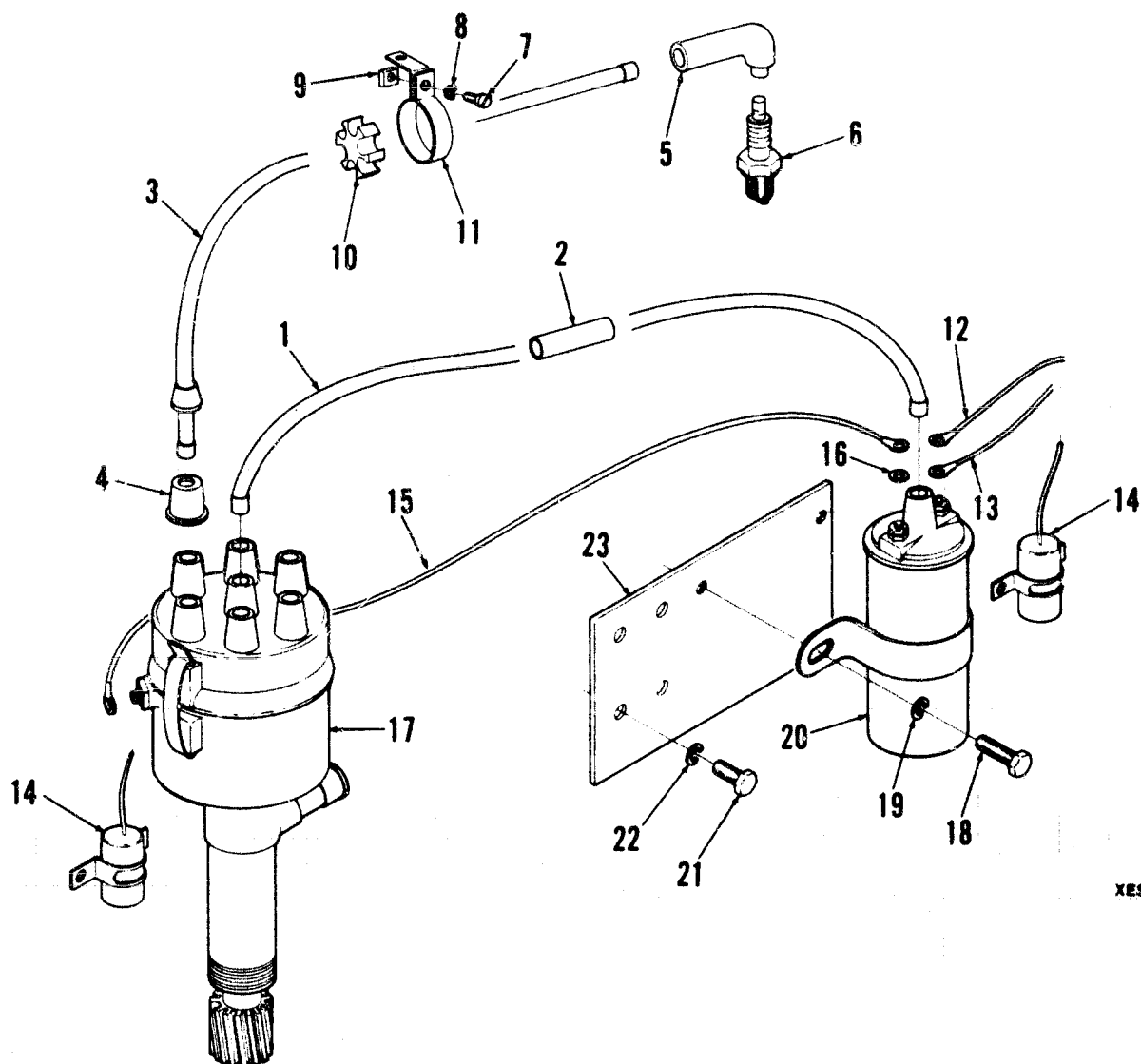
## MISCELLANEOUS ENGINE PARTS

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	WIRING HARNESS - ENGINE		
	338-0603	1	Standard
		1	Special (NOTE: Use Standard Wiring Harness and add electrical leads as required for optional sensors, switches per Gen Set wiring diagram.)
2	133-0150	1	Heatshield
3	309-0269	1	†Switch, Thermostatic - Low Engine Temperature
4	†SWITCH, THERMOSTATIC - WATER TEMPERATURE		
	309-0178	1	Pre-Alarm
	309-0179	1	Shutdown
5	†SENDER, WATER TEMPERATURE		
	193-0246	1	Begin Spec K
	193-0104	1	Specs F Through J
6	BUSHING, REDUCER (SELECT AS APPLICABLE)		
	505-0019	3	Hex (1/2"NPT x 3/8"NPT)
	505-0117	3	Flush (1/2"NPT x 3/8"NPT)
7		1	Assembly - Circuit Breaker & Terminal (Includes Items Marked #)
8	809-0035	1	#Screw, Tapping - Roundhead (#8-3/4")
9	508-0015	1	#Washer, Insulating - Fiber
10	870-0196	1	#Nut, Insulated
11	800-0005	1	#Screw, Cap - Hex Head (1/4-20 x 3/4")
12	862-0001	2	#Nut, Hex (1/4-20)
13	856-0006	1	#Washer, Lock - EIT (1/4")
14	850-0040	1	#Washer, Lock - Spring (1/4")
15	813-0103	2	Screw, Machine - Roundhead (#10-32 x 3/4")
16	850-0030	2	#Washer, Lock - Spring (#10)
17	320	1	#Circuit Breaker
18	332-1382	1	#Board, Mounting
19	800-0051	3	Screw, Cap - Hex Head (3/8-16 x 1-1/4")
20	850-0050	3	Washer, Lock - Spring (3/8")
21	416-0444	1	Cable, Battery - Negative
22	416-0446	1	Cable, Battery - Jumper
23	416-0444	1	Cable, Battery - Positive
24	191-0568	1	Starter (12 VDC)
25	503-0197	1	Clamp, Hose
26	503-0878	1	Hose, Rubber (3/4"ID x 1"OD x 8"Lg)
27	505-0185	1	Nipple, Pipe - Half (1/2"NPT x 1-1/2"Lg)
28	504-0011	1	Cock, Valve (1/2"NPT)
29	505-0100	1	Nipple, Pipe - Close (1/2"NPT x 1-1/8"Lg)
30	505-0021	1	Bushing, Reducer - Hex (1/2"NPT x 3/8"NPT)
31	102-0033	1	Adapter, Oil Drain
32	102-0034	1	Gasket - Oil Drain Adapter
33	309-0064	1	†Switch, Pressure - Oil (Pre-Alarm)
34	309-0169	1	†Switch, Pressure - Oil (Shutdown)
35	†SENDER, OIL PRESSURE		
	193-0244	1	Begin Spec K
	193-0108	1	Specs F Through J
36	505-0059	1	Tee, Pipe (1/8"NPT)
37	505-0763	1	Cross, Pipe (1/8"NPT)
38	505-0098	1	Nipple, Pipe (1/8"NPT x 3/4"Lg)
39	†SENDER, OIL TEMPERATURE		
	193-0249	1	Begin Spec K
	193-0202	1	Specs F Through J
40	155-1194	1	Heatshield (Used on Housed Sets Only)

# - Parts included in Circuit Breaker Assembly.

† - Optional items, used with fault lights or gauges on Engine Control Panel.

## IGNITION SYSTEM

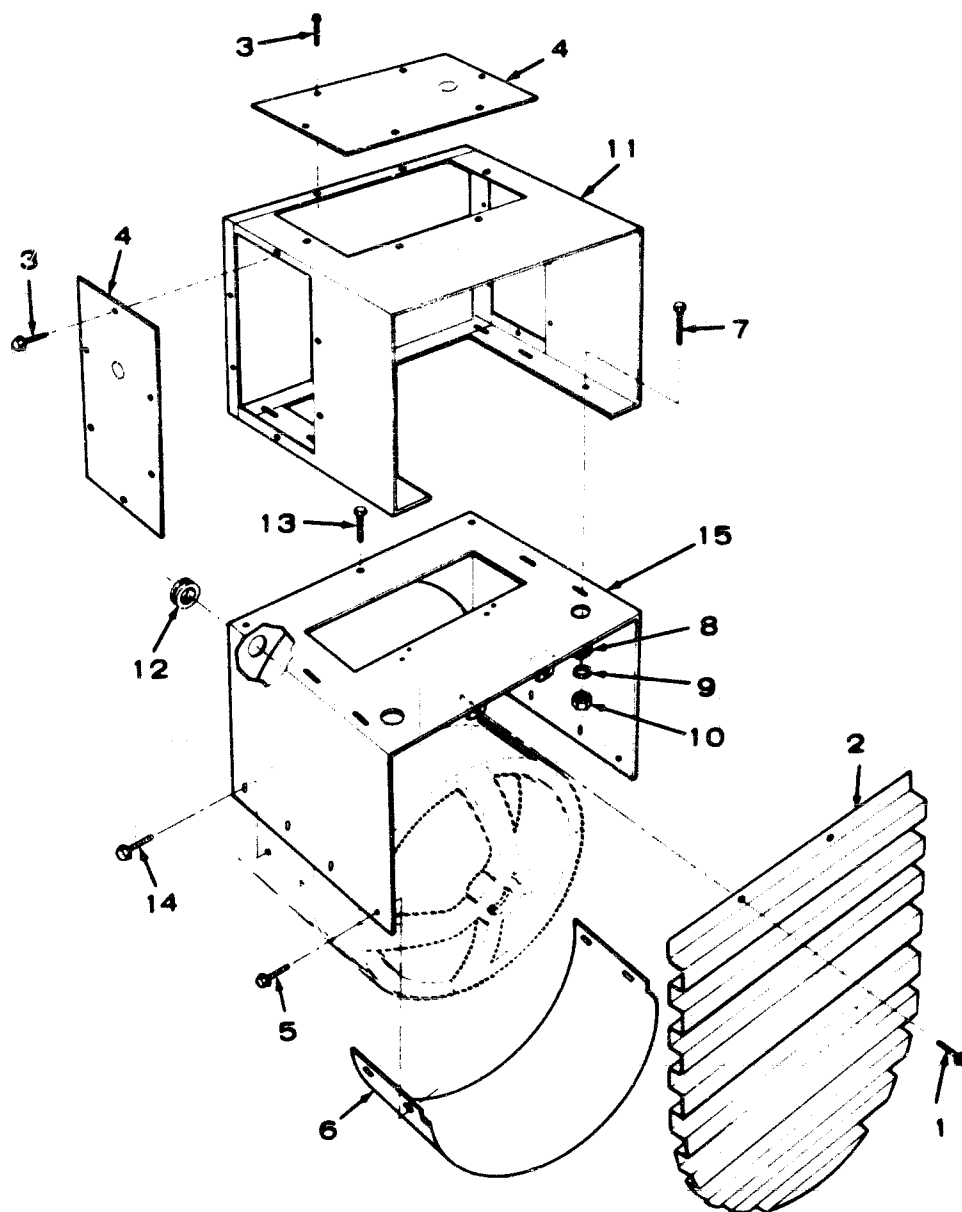


XES 1403

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	#	1	Cable, Coil to Distributor	14	312-0058	2	Capacitor (Without Terminal)
2	314-0006	1	Suppressor, Distributor Cable	15	#	1	Lead, Electrical - Coil to Distributor
3	#	1	Cable Set, Distributor to Plugs	16	526-0050	2	Washer, Flat - Brass (7/32"ID x 1/2"OD x 1/32"Thk)
4	160-0558	6	Nipple, Cable	17	#	1	Distributor
5	314-0156	6	Suppressor, Spark Plug	18	800-0026	2	Screw, Cap - Hex Head (5/16-18 x 3/4")
6	167-0013	6	Sparkplug	19	850-0045	2	Washer, Lock - Spring (5/16")
7	815-0112	1	Screw, Machine - Fillister Head (1/4-20 x 3/4")	20	#	1	Coil - 12 VDC
8	850-0040	1	Washer, Lock - Spring (1/4")	21	801-0003	2	Screw, Cap - Hex Head (1/4-28 x 1/2")
9	861-0011	1	Nut, Square (1/4-20)	22	850-0040	2	Washer, Lock - Spring (1/4")
10	#	1	Spacer, Cable	23	#	1	Bracket, Support - Coil
11	#	1	Bracket, Support - Cable				
12	338-0606	1	Harness, Wiring - Electric Choke				
13	336-2072	1	Lead, Electrical - Ignition				

# - For replacement refer to the Engine Manufacturer

# CONTROL HOUSING

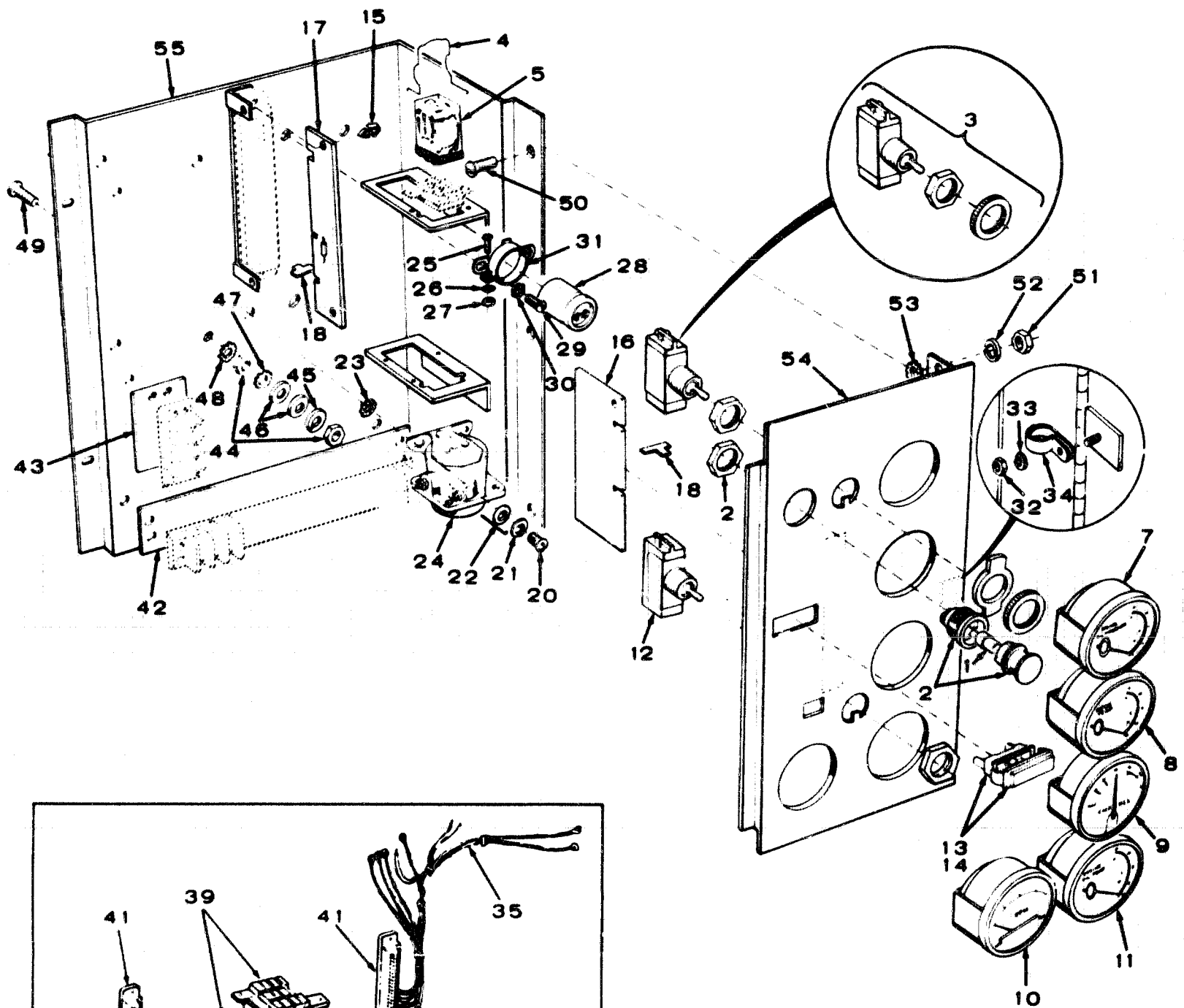


M-1100

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	821-0010	8	Screw, Self-locking - Hex Washer Head (1/4-20 x 1/2")	8	856-0006	1	Washer, Lock - EIT (1/4")
2	234-0370	1	Grill, Air - Generator Inlet	9	526-0018	5	Washer, Flat (17/64" ID x 5/8" OD x 1/16" Thk)
3	815-0350	18	Screw, Tapping - Hex Washer Head (#10-32 x 3/8")	10	870-0212	6	Nut, Hex (1/4-20)
4	301-3156	3	Panel, Access	11	301-3155	1	Housing, Control Box
5	821-0010	4	Screw, Self-locking - Hex Washer Head (1/4-20 x 1/2")	12	508-0203	1	Bushing, Cable - Nylon
6	234-0361	1	Wrapper, End Bell	13	821-0010	1	Screw, Self-locking - Hex Washer Head (1/4-20 x 1/2")
7	821-0018	6	Screw, Self-locking - Hex Washer Head (1/4-20 x 5/8")	14	821-0014	8	Screw, Self-locking - Hex Washer Head (5/16-18 x 1/2")
				15	301-3154	1	Saddle, Control Box



# ENGINE CONTROL WITH ONE FAULT LIGHT



SC-1147

# ENGINE CONTROL WITH ONE FAULT LIGHT

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	322-0004	1	Lamp incandescent (12 VDC)
2	322-0149	1	Lampholder
3	308-0002	1	Switch, Toggle (SPST)
4	307-1157	3	Spring, Holddown - Relay
5	RELAY (12 VDC)		
	307-1058	1	(Ignition)
	307-1058	1	(Start Disconnect)
	307-1061	1	(Starter Protection)
7	GAUGE, OIL PRESSURE		
	193-0243	1	Begin Spec K
	193-0107	1	Specs F Through J
8	GAUGE, WATER TEMPERATURE		
	193-0245	1	Begin Spec K
	193-0106	1	Specs F Through J
9	302-0061	1	Ammeter
10	302-0749	1	£Tachometer - Electrical
11	£GAUGE, OIL TEMPERATURE		
	193-0248	1	Begin Spec K
	193-0187	1	Specs F Through J
12	SWITCH, TOGGLE - SELECTOR		
	308-0138	1	Standard & Cycle Cranking Controls
	308-0327	1	Penn State Controls
13	*LIGHT, INDICATOR (Lens Color & Legend Listed Below)		
	322-0128	1	Red - Fault - 14 VDC
14	322-0136	1	*Light, Indicator - 12 VDC (Red Lens - No Legend)
15	518-0374	4	Fastener, Snap-In (Printed Circuit Boards)
16	PRINTED CIRCUIT BOARD ASSEMBLY		
	300-0733	1	Standard Cranker (12 VDC)
	300-0714	1	Cycle Cranker (12 VDC)
17	PRINTED CIRCUIT BOARD ASSEMBLY		
	300-0679	1	Engine Control Monitor - Standard
	300-0730	1	Engine Control Monitor - Penn-State
18	332-1276	4	Plug, Keying - PC Board
20	813-0098	2	Screw, Machine - Round Head (#10-32 x 3/8")
21	850-0030	2	Washer, Lock - Spring (#10)
22	526-0009	2	Washer, Flat (7/32" ID x 1/2" OD x 1/16" Thk)
23	856-0003	2	Washer, Lock - EIT (#10)
24	307-1031	1	Relay, Solenoid - Start (12 VDC)
25	812-0061	1	Screw, Machine - Round Head (#6-32 x 3/8")
26	860-0006	1	Nut, Hex (#6-32)
27	853-0003	1	Washer, Lock - ET (#6)
28	356-0072	1	Capacitor, Fixed Electrolytic (4000 MFD, 30 VDC)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
29	812-0063	2	Screw, Machine - Round Head (#6-32 x 1/2")
30	853-0003	2	Washer, Lock - ET (#6)
31	356-0070	1	Clamp, Capacitor Mounting
32	870-0053	1	Nut, Hex (#10-32)
33	850-0030	1	Washer, Lock - Spring (#10)
34	332-0051	1	Clamp, Loop
35	HARNESS, WIRING - ENGINE CONTROL		(Includes Parts Marked †)
	338-1065	1	Begin Spec K
	338-0528	1	Specs F Through J
	ATTACHING HARDWARE FOR WIRING HARNESS		
	812-0061	4	Screw, Machine - Round Head (#6-32 x 3/8")
	812-0066	6	Screw, Machine - Round Head (#6-32 x 3/4")
	853-0003	14	Washer, Lock - ET (#6)
	860-0006	10	Nut, Hex (#6-32)
36	332-1043	1	†Jumper, Terminal
37	332-0795	1	†Block, Terminal - 16 Place
38	332-0537	1	†Block, Terminal - 4 Place
39	323-0765	2	†Socket, Relay - 11 Place
40	323-0764	1	†Socket, Relay - 8 Place
41	332-1271	2	†Connector, Electrical - PC BD
42	332-1241	1	Strip, Marker - Terminal
43	332-1239	1	Strip, Marker - Terminal
	GROUND TERMINAL ASSEMBLY (Includes Parts Marked #)		
44	871-0010	2	#Nut, Hex - Brass (#10-32)
45	850-0030	1	#Washer, Lock - Spring (#10)
46	526-0062	2	#Washer, Flat - Brass (13/64" ID x 1/2" OD x 1/16" Thk)
47	853-0008	1	#Washer, Lock - ET (#10)
48	856-0003	1	#Washer, Lock - EIT (#10)
49	815-0203	1	#Screw, Machine - Round Head Brass (#10-32 x 7/8")
50	815-0026	5	Screw, Machine - Truss Head (#10-32 x 3/8")
51	870-0053	1	Nut, Hex (#10-32)
52	850-0030	1	Washer, Lock - Spring (#10)
53	856-0003	1	Washer, Lock - EIT (#10)
54	PANEL, CONTROL - ENGINE		
	301-3165	1	With Three Gauge Mtg. Holes
	301-3286	1	With Four Gauge Mtg. Holes
	301-3396	1	With Five Gauge Mtg. Holes
55	301-3253	1	Bracket, Mounting Engine Control

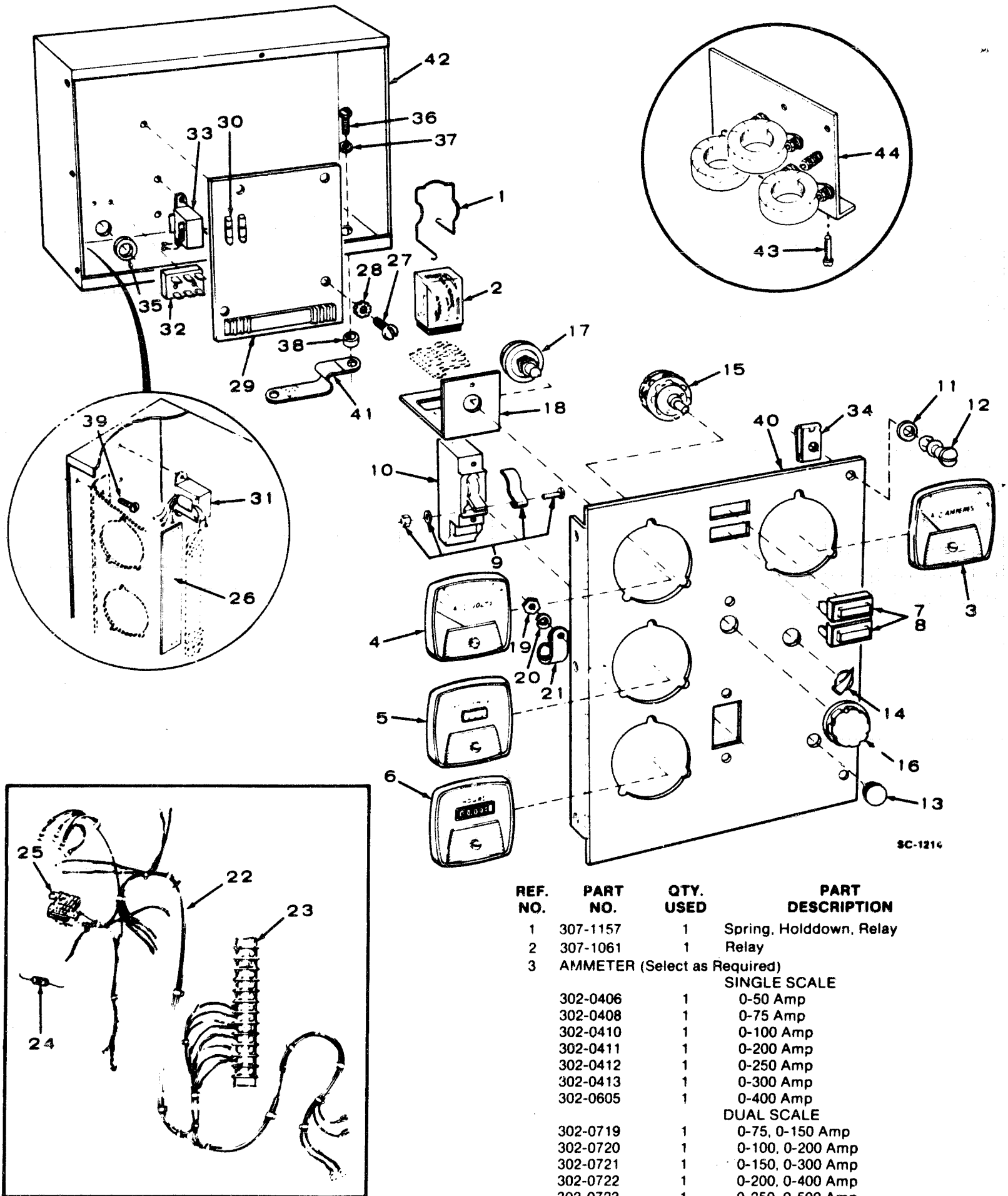
\* - Note: For lamp replacement order 322-0136 remove and discard plain red lens, install lens with legend from burned out light—lights snap in and out of panel.

£ - Optional items used with Engine Mounted Senders.

† - Parts included in Wiring Harness.

# - Parts included in Ground Terminal Assembly.

# GENERATOR CONTROL

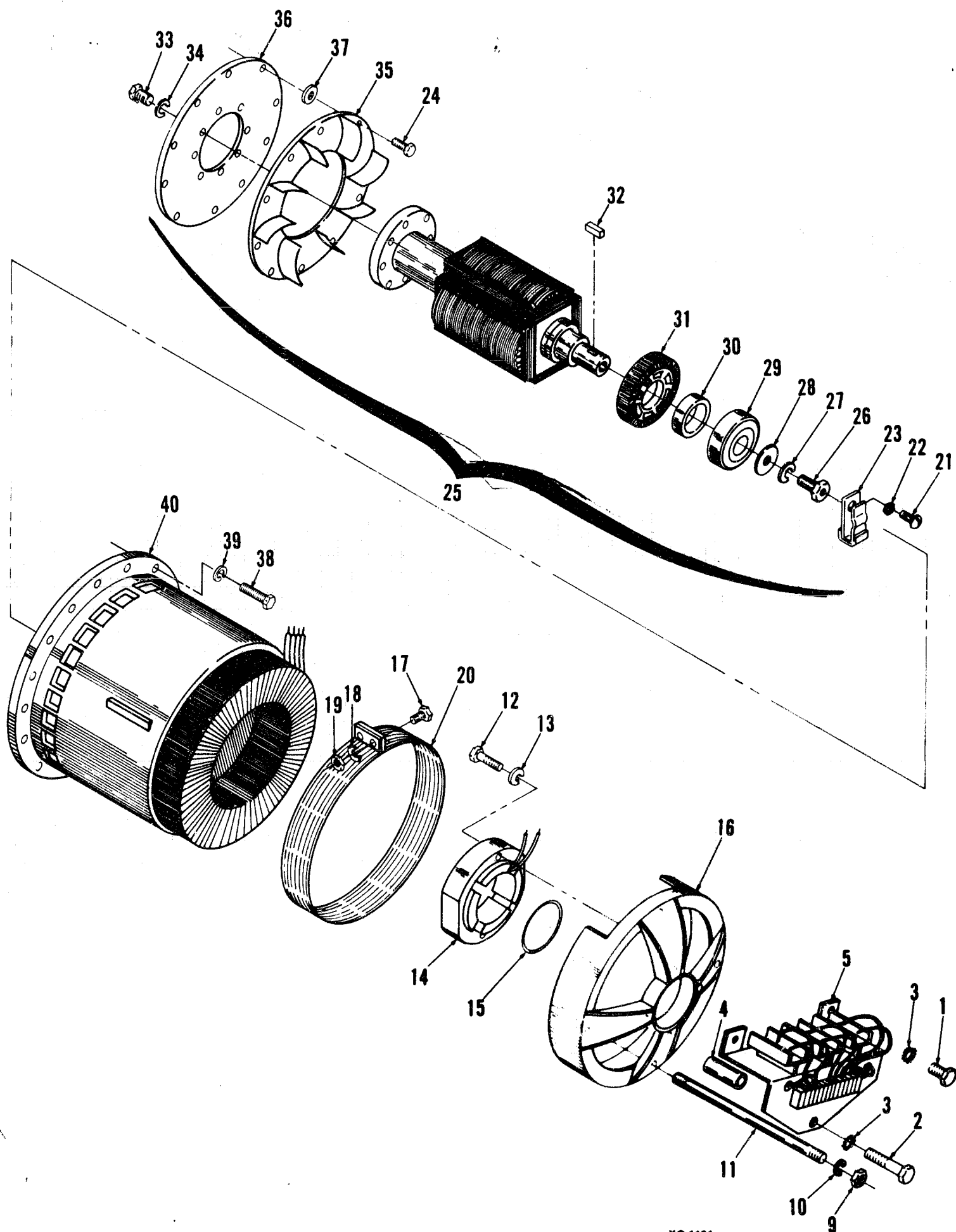


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	307-1157	1	Spring, Holddown, Relay
2	307-1061	1	Relay
3	AMMETER (Select as Required)		
			SINGLE SCALE
	302-0406	1	0-50 Amp
	302-0408	1	0-75 Amp
	302-0410	1	0-100 Amp
	302-0411	1	0-200 Amp
	302-0412	1	0-250 Amp
	302-0413	1	0-300 Amp
	302-0605	1	0-400 Amp
			DUAL SCALE
	302-0719	1	0-75, 0-150 Amp
	302-0720	1	0-100, 0-200 Amp
	302-0721	1	0-150, 0-300 Amp
	302-0722	1	0-200, 0-400 Amp
	302-0723	1	0-250, 0-500 Amp
	302-0724	1	0-375, 0-750 Amp

# GENERATOR CONTROL

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
4	VOLTMETER (Select as Required)			23	BLOCK, TERMINAL (Select as Required)		
	302-0421	1	SINGLE SCALE		332-0607	1	12 Place
	302-0422	1	0-300 Volt		332-0795	1	16 Place
	302-0612	1	0-600 Volt	24	350-0556	1	Resistor, Fixed, Composition (47K Ohms, 1/2 Watt) - Code 15, 515
	302-0779	1	0-500 Volt				
			0-750 Volt	25	323-0765	1	Socket, Relay - 11 Place - Code 15, 515
	302-0718	1	DUAL SCALE				
5	METER, FREQUENCY (Select as Required)			26	STRIP, MARKER (Select as Required)		
			REED TYPE		332-1242	1	16 Place
	302-0213	1	115 VAC, 60 Hz		332-1248	1	12 Place
	302-0221	1	230 VAC, 60 Hz	27	812-0065	4	Screw, Machine - Round Head (#6-32 x 5/8")
	302-0234	1	115 VAC, 50 Hz				
	302-0256	1	230 VAC, 50 Hz	28	853-0003	4	Washer, Lock - ET (#6)
			POINTER TYPE	29	REGULATOR, VOLTAGE (Select as Required)		
	302-0809	1	120 VAC, 60 Hz		<b>NOTE: REGULATOR MATCHED TO VOLTAGE TRANSFORMER, Item #31.</b>		
	302-0810	1	208 VAC, 60 Hz		332-1268	1	Used with 120 VAC Input Signal
	302-0811	1	240 VAC, 60 Hz		332-1956	1	Used with 240 VAC Input Signal
6	METER, TIME TOTALIZING (Select as Required)			30	321-0204	2	Fuse, Cartridge (1/4 Amp) - Part of 332-1956 Voltage Regulator
	302-0466	1	60 Hz				
	302-0469	1	50 Hz	31	TRANSFORMER, VOLTAGE (Select as Required)		
7	LIGHT, INDICATOR - 125 VAC (Lens Color & Legend Listed Below)				<b>NOTE: Transformer Matched to Voltage Regulator, Item #29</b>		
	322-0130	1	Red - Lower Scale		315-0342	1	120 VAC
	322-0131	1	Red - Upper Scale		315-0431	1	240 VAC
8	322-0178	1	Light, Indicator - 125 VAC		ATTACHING PARTS FOR TRANSFORMER		
	(Replacement) - Discard Lens - Used Lens From Original Light				812-0061	2	Screw, Machine - Round Head (#6-32 x 3/8")
9	320-0307	1	Lock - Circuit Breaker Handle (Penn State Sets)				
	ATTACHING HARDWARE FOR LOCK				853-0003	2	Washer, Lock - ET (#6)
	815-0203	1	Screw, Machine - Round Head (#10-32 x 7/8")	32	305-0675	1	Rectifier, Bridge
	854-0010	1	Washer, Lock - IT (#10)		ATTACHING PARTS FOR RECTIFIER		
	871-0010	1	Nut, Hex (#10-32)		812-0070	2	Screw, Machine - Round Head (#6-32 x 1-1/4")
10	320-0431	1	Circuit Breaker		850-0020	2	Washer Lock - Spring (#6)
	ATTACHING HARDWARE FOR CIRCUIT BREAKER			33	315-0384	1	Reactor
	812-0061	2	Screw, Machine - Round Head (#6-32 x 3/8")		ATTACHING PARTS FOR REACTOR		
	850-0020	2	Washer, Lock - Spring (#6)		812-0061	2	Screw, Machine - Round Head (#6-32 x 3/8")
	815-0203	1	Screw, Machine - Round Head, Brass (#10-32 x 7/8")		853-0003	2	Washer, Lock - ET (#6)
	871-0010	1	Nut, Hex - Brass (#10-32)	34	406-0332	2	Receptacle, Turnbutton Fastener
	853-0008	1	Washer, Lock - ET (#10)	35	508-0001	4	Grommet, Rubber
	526-0049	1	Washer, Flat - Brass (13/64" ID x 7/16" OD x 132" Thk)	36	800-0045	4	Screw, Cap - Hex Head (5/16-18 x 3/8")
11	406-0334	2	Clip, Retaining - Turnbutton Fastener	37	850-0045	4	Washer, Lock - Spring (5/16")
12	406-0333	2	Stud, Turnbutton Fastener	38	402-0070	4	Dampener, Vibration
13	517-0131	1	Plug, Plastic	39	815-0026	3	Screw, Machine - Truss Head (#10-32 x 3/8")
14	303-0076	1	Knob, Pointer	40	PANEL CONTROL		
15	308-0284	1	Switch, Selector		<b>Sets Without Meter Panel</b>		
16	303-0032	1	Knob		301-3821	1	Code 6D, 7, 9X
17	363-0170	1	Rheostat (35K Ohms, 25 Watt)		301-3274	1	Code 15, 515
18	301-3244	1	Bracket, Mounting, Relay - Code 15, 515		<b>Sets With Meter Panel</b>		
19	870-0053	1	Nut, Hex (#10-32)		301-3342	1	Code 6D, 7, 9X
20	850-0030	1	Washer, Lock - Spring (#10)		301-3170	1	Code 15, 515
21	332-0051	1	Clamp, Loop	41	337-0049	1	Strap, Ground
22	HARNESS, WIRING - GENERATOR CONTROL				ATTACHING PARTS FOR STRAP		
			Begin Spec J		800-0045	1	Screw, Cap - Hex Head (5/16-18 x 3/8")
	338-0730	1	Code 15, 515		850-0045	1	Washer, Lock - Spring (5/16")
	338-0759	1	Code 6D, 7, 9X		856-0008	2	Washer, Lock - ET (5/16")
			Spec F Through H		862-0015	1	Nut, Hex (5/16-18)
	338-0525	1	Code 15, 515	42	301-3158	1	Box, Control
	338-0571	1	Code 6D, 7, 9X	43	821-0010	2	Screw, Self-locking - Hex Washer Head (1/4-20 x 1/2")
	ATTACHING HARDWARE FOR WIRING HARNESS			44	CURRENT TRANSFORMER ASSEMBLY (See Separate Figure For Parts) - <b>NOTE: Assembly is Located Behind the Control Box.</b>		
	812-0061	2	Screw, Machine - Round Head (#6-32 x 3/8")				
	812-0066	2	Screw, Machine - Round Head (#6-32 x 3/4")				
	850-0020	2	Washer, Lock - Spring (#6)				
	853-0003	4	Washer, Lock - ET (#6)				
	853-0006	2	Nut, Hex (#6-32)				

# **GENERATOR ASSEMBLY - BRUSHLESS TYPE WITH INTEGRAL VOLTAGE REGULATOR**



XG 1151

# GENERATOR ASSEMBLY - BRUSHLESS TYPE WITH INTEGRAL VOLTAGE REGULATOR

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	800-0003	2	Screw, Cap - Hex Head (1/4-20 x 1/2")
2	800-0009	2	Screw, Cap - Hex Head (1/4-20 x 1-1/2")
3	853-0013	4	Washer, Lock - ET (1/4")
4	305-0481	2	Spacer, Sleeve
5	305-0491	1	Regulator, Voltage (See Separate Group for Components)
9	862-0011	4	Nut, Hex - Grade 8 (3/8-16)
10	850-0050	4	Washer, Lock - Spring (3/8")
11	520-0735	4	Stud, (3/8-16 UNC x 5-3/4")
12	800-0009	4	Screw, Cap - Hex Head (1/4-20 x 1-1/2")
13	850-0040	4	Washer, Lock - Spring (1/4")
14	STATOR, EXCITER (Select as Required)		
	220-2353	1	Standard
	220-1774	1	§Environmental Protected
15	509-0125	1	Seal, Oil - "O" Ring
16	211-0185	1	End Bell, Generator
17	800-0008	2	Screw, Cap - Hex Head (1/4-20 x 1-1/4")
18	850-0040	2	Washer, Lock - Spring (1/4")
19	862-0001	2	Nut, Hex (1/4-20)
20	234-0368	1	Screen, Air - Generator
21	800-0048	1	Screw, Cap - Hex Head (3/8-16 x 3/4")
22	856-0010	1	Washer, Lock - EIT (3/8")
23	150-0717	1	Switch, Overspeed
24	805-0032	8	Bolt, Place - Hex Head, Grade 8 (1/2-13 x 1-1/4")
25	ROTOR ASSEMBLY, GENERATOR (Includes Parts Marked *)		
<b>50 HERTZ SETS</b>			
	201-2678	1	95 kW, Code 515
	201-1844	1	‡ 95 kW, Code 515 (Extended Stack)
<b>60 HERTZ SETS</b>			
	201-2678	1	115 kW, Code 9X
	201-2678	1	115 kW, Code 15
	201-1844	1	‡115 kW, Code 15 (Extended Stack)
	201-2677	1	100 kW, Code 15 R30
	201-2677	1	100 kW, Code 15 R31
26	800-0513	1	*Screw, Cap - Hex Head, Modified with 3/8-16 Tapped Center Hole (3/4-10 x 1-1/2")

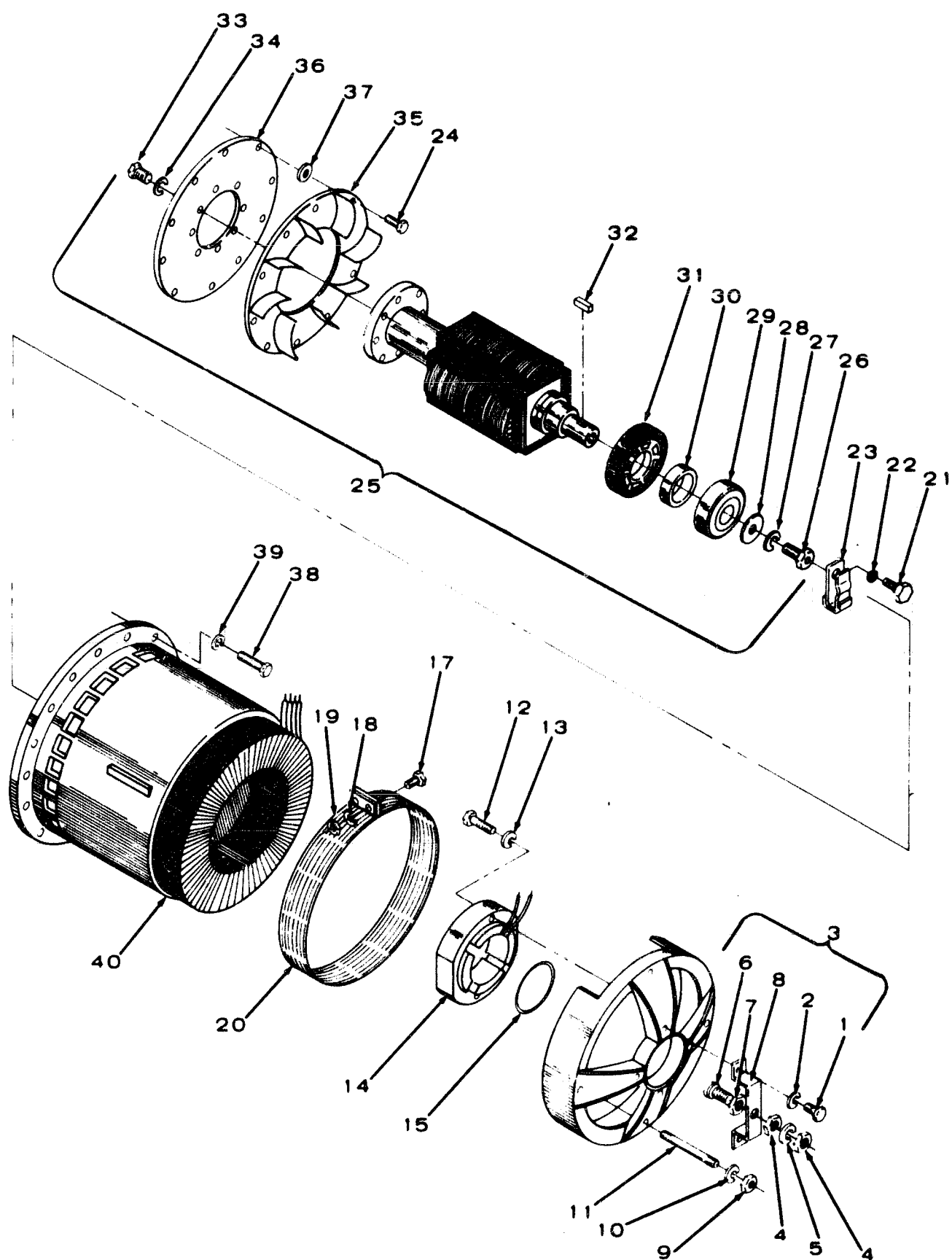
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
27	850-0079	1	*Washer, Lock - Spring (3/4")
28	526-0238	1	*Washer, Flat - Steel Alloy (13/16" ID x 2" OD x 3/16" Thk)
29	510-0101	1	*Bearing, Ball
30	232-2102	1	*Spacer, Sleeve
31	*ROTOR ASSEMBLY, EXCITER (See Separate Illustration for Component Parts)		
	201-1739	1	Standard
	201-1845	1	§Environmental Protected
32	515-0145	1	*Key, Machine (1/4" x 1/4" x 7/8")
33	*BOLT, PLACE - HEX HEAD, GRADE 8 (Select as Required)		
	805-0033	8	5/8-11 x 1"
	805-0035	8	5/8-11 x 1-1/2"
34	526-0259	8	*Washer, Flat - Std Hardened (11/16" OD x 1-3/8" OD x 7/64" Thk)
35	205-0095	1	*Fan, Generator
36	232-2037	1	*Disc, Drive - Generator
37	526-0028	8	Washer, Flat (9/16" ID x 15/16" OD x 1/16" Thk) Used Only on 180 kW Sets
38	800-0073	12	Screw, Cap - Hex Head (7/16-14 x 1-1/2")
39	850-0055	12	Washer, Lock - Spring (7/16")
40	STATOR ASSEMBLY, GENERATOR (Select as Required)		
<b>50 HERTZ SETS</b>			
	220-1516	1	95 kW, Code 515
	220-1519	1	‡ 95 kW, Code 515 (Extended Stack)
<b>60 HERTZ SETS</b>			
	220-1611	1	115 kW, Code 9X
	220-1516	1	115 kW, Code 15
	220-1519	1	‡115 kW, Code 15 (Extended Stack)
	220-1515	1	100 kW, Code 15 R30
	220-1515	1	100 kW, Code 15 R31

+ - Parts Included in Overspeed Switch Assembly

\* - Parts Included in Generator Rotor Assembly

‡ - Extended Stack type assemblies that are used on sets having full power output on both single and three phase hookups. Both phases carry same kW and kVA ratings.

# **GENERATOR ASSEMBLY - BRUSHLESS TYPE USED WITH REMOTE VOLTAGE REGULATOR**



G-1116

# GENERATOR ASSEMBLY - BRUSHLESS TYPE USED WITH REMOTE VOLTAGE REGULATOR

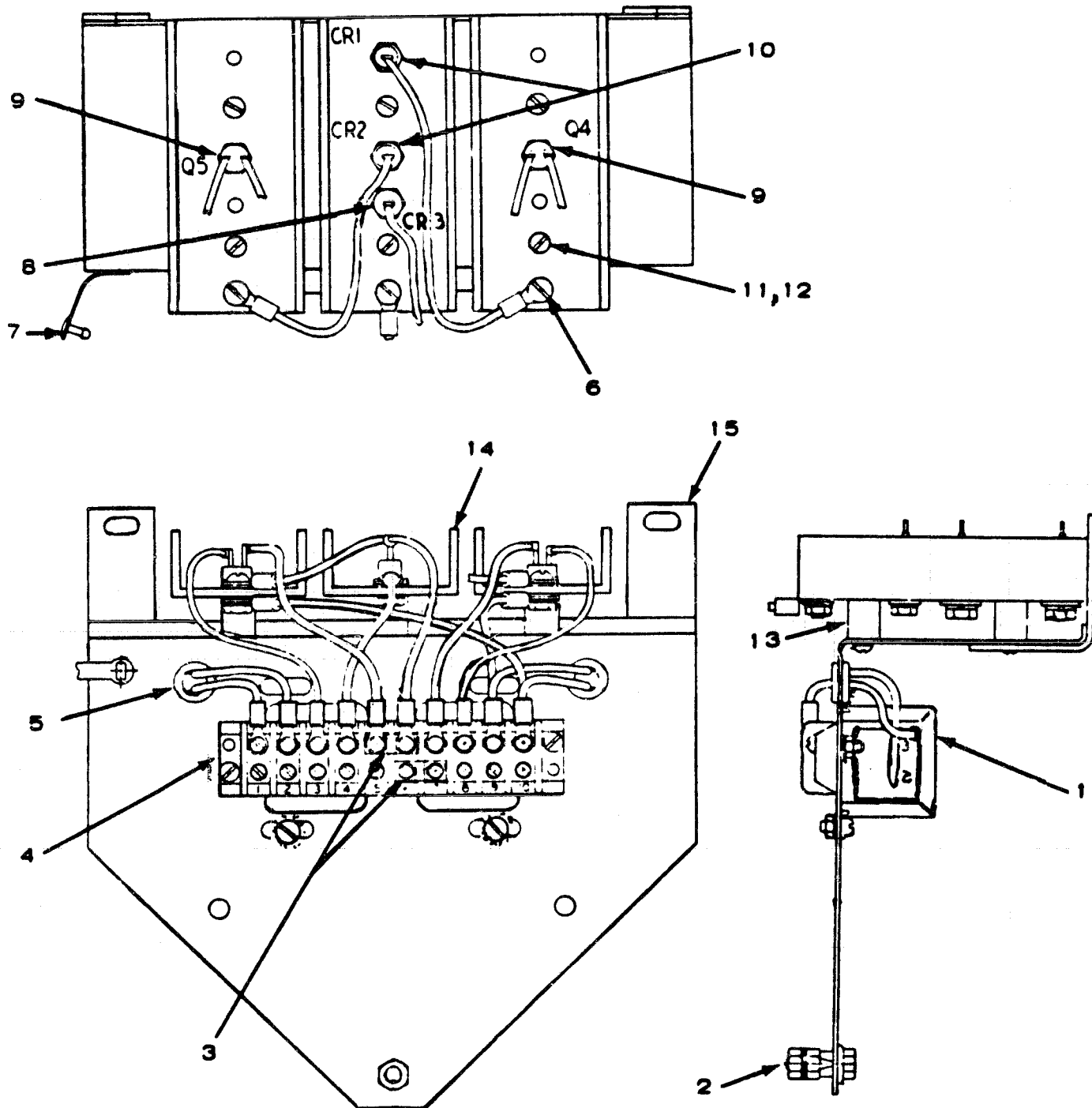
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	800-0003	2	Screw, Cap - Hex Head (1/4-20 x 1/2")
2	850-0040	2	Washer, Lock - Spring (1/4")
3	150-1456	1	Contact Assembly - Overspeed Switch (Includes Parts Marked +)
4	862-0001	2	+Nut, Hex (1/4-20)
5	853-0013	1	+Washer, Lock - ET (1/4")
6	150-0723	1	+Contact, Electrical
7	870-0250	1	+Nut, Insulator
8	150-1356	1	+Bracket, Mounting - Contact
9	862-0011	4	Nut, Hex - Grade 8 (3/8-16)
10	850-0050	4	Washer, Lock - Spring (3/8")
11	520-0735	4	Stud, (3/8-16 UNC x 5-3/4")
12	800-0009	4	Screw, Cap - Hex Head (1/4-20 x 1-1/2")
13	850-0040	4	Washer, Lock - Spring (1/4")
14	STATOR, EXCITER (Select as Required)		
	220-2353	1	Standard
	220-1774	1	§Environmental Protected
15	509-0125	1	Seal, Oil - "O" Ring
16	211-0185	1	End Bell, Generator
17	800-0008	2	Screw, Cap - Hex Head (1/4-20 x 1-1/4")
18	850-0040	2	Washer, Lock - Spring (1/4")
19	862-0001	2	Nut, Hex (1/4-20)
20	234-0368	1	Screen, Air - Generator
21	800-0048	1	Screw, Cap - Hex Head (3/8-16 x 3/4")
22	856-0010	1	Washer, Lock - EIT (3/8")
23	150-0717	1	Switch, Overspeed
24	805-0032	8	Bolt, Place - Hex Head, Grade 8 (1/2-13 x 1-1/4")
25	ROTOR ASSEMBLY, GENERATOR (Includes Parts Marked *)		
<b>50 HERTZ SETS</b>			
201-2678	1	95 kW, Code 515	
201-2478	1	‡ 95 kW, Code 515 (Extended Stack)	
<b>60 HERTZ SETS</b>			
201-2678	1	115 kW, Code 6D	
201-2678	1	115 kW, Code 7	
201-2678	1	115 kW, Code 9X	
201-2678	1	115 kW, Code 15	
201-2478	1	‡115 kW, Code 15 (Extended Stack)	
201-2696	1	£115 kW, Code 15 (Environmental Protected)	
201-2356	1	‡£115 kW, Code 15 (Extended Stack and Environmental Protected)	
26	800-0513	1	*Screw, Cap - Hex Head, Modified with 3/8-16 Tapped Center Hole (3/4-10 x 1-1/2")

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
27	850-0079	1	*Washer, Lock - Spring (3/4")
28	526-0238	1	*Washer, Flat - Steel Alloy (13/16" ID x 2" OD x 3/16" Thk)
29	510-0101	1	*Bearing, Ball
30	232-2102	1	*Spacer, Sleeve
31	*ROTOR ASSEMBLY, EXCITER (See Separate Illustration for Component Parts)		
	201-1739	1	Standard
	201-1845	1	§Environmental Protected
32	515-0145	1	*Key, Machine (1/4" x 1/4" x 7/8")
33	*BOLT, PLACE - HEX HEAD, GRADE 8 (Select as Required)		
	805-0033	8	5/8-11 x 1"
	805-0035	8	5/8-11 x 1-1/2"
34	526-0259	8	*Washer, Flat - Std Hardened (11/16" OD x 1-3/8" OD x 7/64" Thk)
35	205-0095	1	*Fan, Generator
36	232-2037	1	*Disc, Drive - Generator
37	526-0028	8	Washer, Flat (9/16" ID x 15/16" OD x 1/16" Thk) Used Only on 180 kW Sets
38	800-0073	12	Screw, Cap - Hex Head (7/16-14 x 1-1/2")
39	850-0055	12	Washer, Lock - Spring (7/16")
40	STATOR ASSEMBLY, GENERATOR (Select as Required)		
<b>50 HERTZ SETS</b>			
	220-1988	1	kW, Code 515
	220-1991	1	‡kW, Code 515 (Extended Stack)
<b>60 HERTZ SETS</b>			
	220-2638	1	kW, Codes 6D
	220-2453	1	kW, Code 7
	220-1611	1	kW, Code 9X
	220-1516	1	kW, Code 15
	220-1519	1	‡kW, Code 15 (Extended Stack)
	220-1777	1	£kW, Code 15 (Environmental Protected)
	220-1780	1	‡£kW, Code 15 (Extended Stack and Environmental Protected)

+ - Parts Included in Overspeed Switch Assembly  
 \* - Parts Included in Generator Rotor Assembly  
 ‡ - Extended Stack type assemblies that are used on sets having full power output on both single and three phase hookups. Both phases carry same kW and kVA ratings.  
 £ - Environmental protected assemblies or parts which are coated with epoxy and are for use in high humidity areas.



# **VOLTAGE REGULATOR - END BELL MOUNTED** **USED WITH BRUSHLESS GENERATOR**

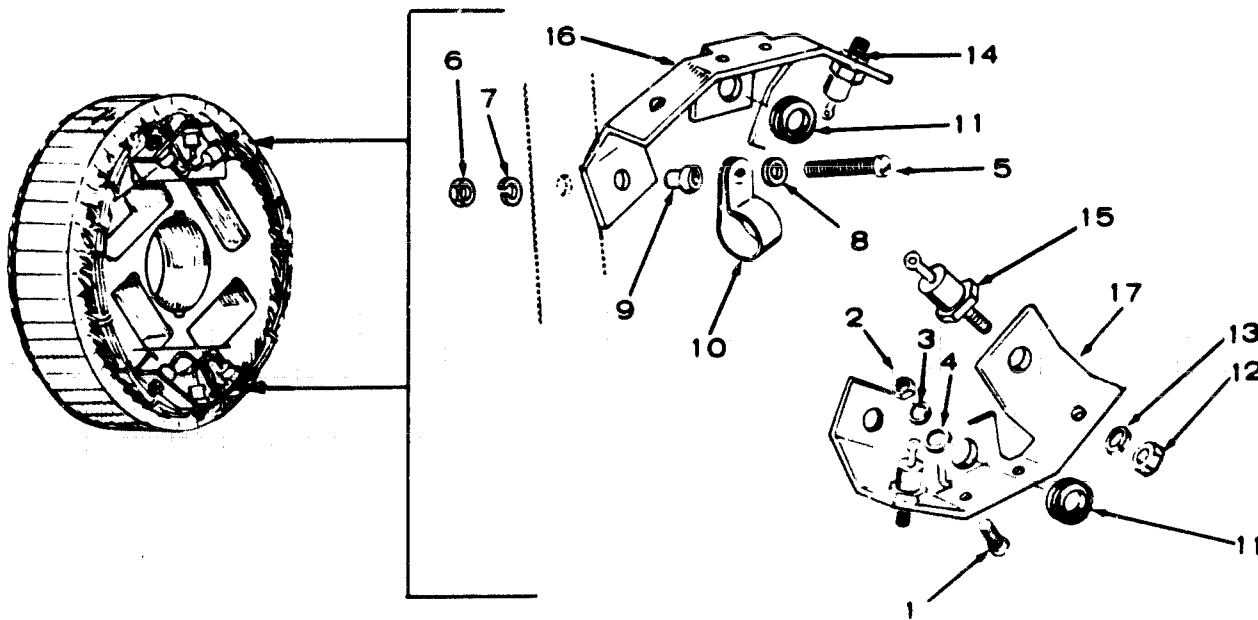


# VOLTAGE REGULATOR -- END BELL MOUNTED USED WITH BRUSHLESS GENERATOR

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	REGULATOR, VOLTAGE						
	305-0491	1	Used on 30 (25) Through 90 (75) kW Sets	7	332-1415	1	Clamp, Cable
1	315-0343	1	Reactor (L1)	8	358-0029	1	Rectifier (CR3)
			ATTACHING PARTS FOR REACTOR				ATTACHING PARTS FOR RECTIFIER
	812-0077	2	Screw, Machine - Round Head (#8-32 x 3/8")		871-0010	1	Nut, Hex - Brass (#10-32)
	853-0005	2	Washer, Lock - ET (#8)		850-0030	1	Washer, Lock - Spring (#10)
	860-0008	2	Nut, Hex (#8-32)		526-0009	1	Washer, Flat (7/32" ID x 1/2" OD 1/16" Thk)
			-----				-----
2	CONTACT ASSEMBLY - OVERSPEED SWITCH (Includes the following parts Marked +)			9	364-0012	2	Rectifier (Q4, Q5)
	862-0001	2	+Nut, Hex (1/4-20)				ATTACHING PARTS FOR RECTIFIER
	853-0013	1	+Washer, Lock - ET (1/4")		871-0018	2	Nut, Hex - Brass (1/4-20)
	870-0250	1	+Nut, Insulating (1/4")		850-0040	2	Washer, Lock - Spring (1/4")
	150-0723	1	+Contact, Electrical - Threaded with Hex Head		526-0018	2	Washer, Flat (17/64" ID x 5/8" OD x 1/16" Thk)
			-----				-----
3	332-1043	2	Jumper - Terminal	10	358-0035	2	Rectifier (CR1, CR2)
4	332-1266	1	Block, Terminal				ATTACHING PARTS FOR RECTIFIER
			ATTACHING PARTS FOR TERMINAL BLOCK				
	812-0081	2	Screw, Machine - Round Head (#8-32 x 5/8")		871-0018	2	Nut, Hex - Brass (1/4-20)
	853-0005	2	Washer, Lock - ET (#8)		850-0040	2	Washer, Lock - Spring (1/4")
	860-0008	2	Nut, Hex (#8-32)		526-0018	2	Washer, Flat (17/64" ID x 5/8" OD x 1/16" Thk)
			-----				-----
5	508-0002	2	Grommet, Rubber	11	812-0077	12	Screw, Machine - Round Head (#8-32 x 3/8")
6	ATTACHING HARDWARE FOR LEADS			12	853-0005	12	Washer, Lock - ET (#8)
	812-0079	3	Screw, Machine - Round Head (#8-32 x 1/2")	13	332-1265	6	Insulator, Standoff
	853-0005	3	Washer, Lock - ET (#8)	14	363-0048	3	Heatsink
	526-0048	2	Washer, Flat - Brass (11/64" ID x 3/8" OD x 1/32" Thk)	15	305-0482	1	Chassis
	871-0007	3	Nut, Hex - Brass (#8-32)				
			-----				

+ Parts included in Overspeed Switch Contact Assembly.

# EXCITER ROTOR

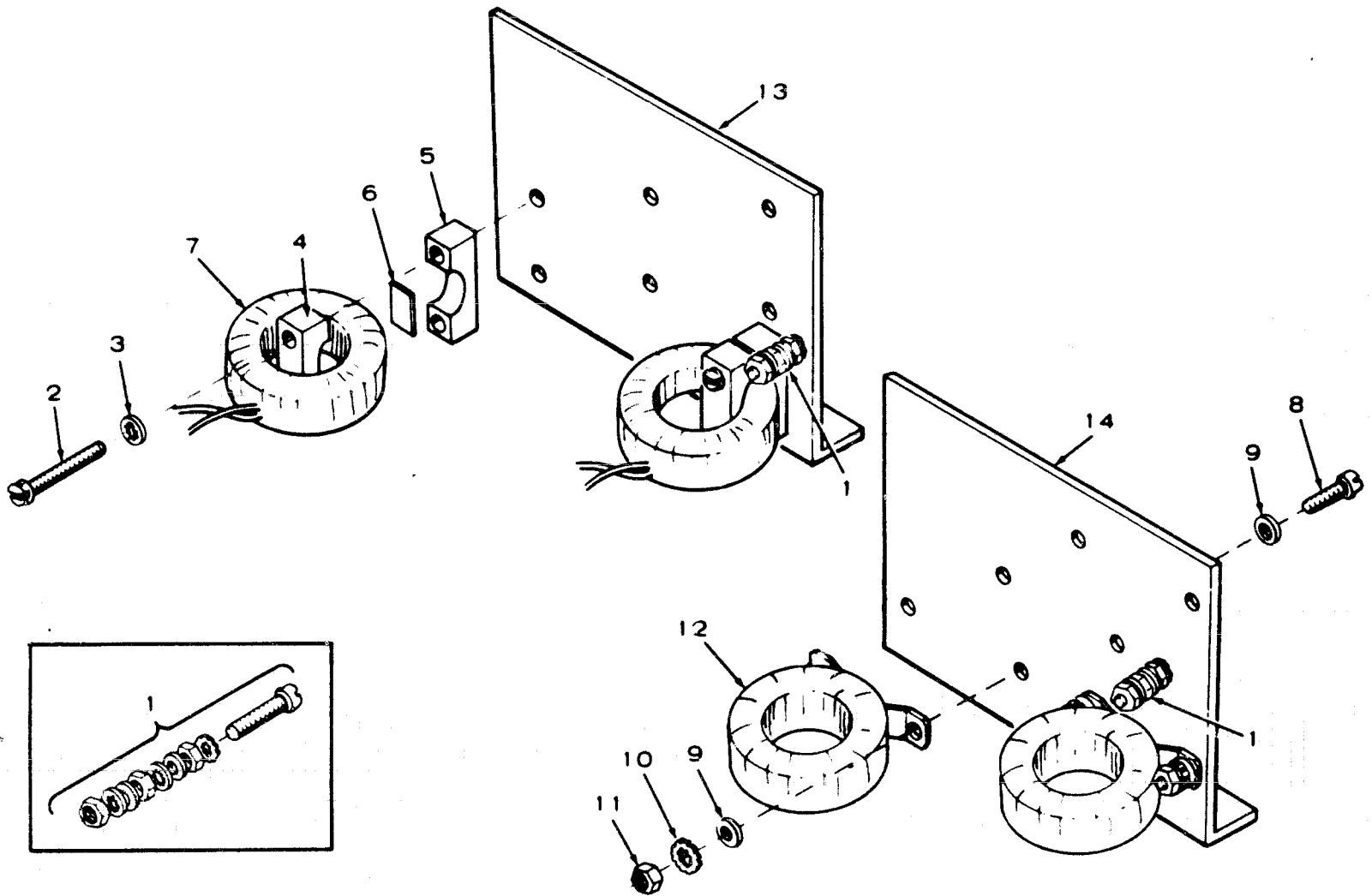


G 1030

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
ROTOR ASSEMBLY, EXCITER (Includes Parts Marked *)			
	201-1739	1	Standard
	201-1845	1	Environmental Protected (Epoxyed)
1	813-0100	2	Screw, Machine - Roundhead (#10-32 x 1/2")
2	870-0053	2	Nut, Hex (#10-32)
3	850-0030	2	Washer, Lock - Spring (#10)
4	526-0008	2	Washer, Flat (13/64" ID x 7/16" OD x 1/32" Thk)
5	813-0110	4	*Screw, Machine - Roundhead (#10-32 x 2")
6	870-0053	4	*Nut, Hex (#10-32)
7	850-0030	4	*Washer, Lock - Spring (#10)
8	526-0009	4	*Washer, Flat (7/32" ID x 1/2" OD x 1/16" Thk)
9	508-0187	4	*Spacer, Stepped
10	332-0050	2	*Clamp, Loop
11	508-0093	2	*Grommet, Rubber
12	870-0053	6	*Nut, Hex (#10-32)
13	850-0030	6	*Washer, Lock - Spring (#10)
14	*DIODE, RECTIFIER - POSITIVE (CR1, CR2, CR3)		
	358-0016	3	Standard
	358-0044	3	Environmental Protected (Epoxyed)
15	*DIODE, RECTIFIER - NEGATIVE (CR4, CR5, CR6)		
	358-0015	3	Standard
	358-0043	3	Environmental Protected (Epoxyed)
16	363-0054	1	*Heat, Sink - Positive Diodes
17	363-0055	1	*Heat, Sink - Negative Diodes

\* - Parts included in Exciter Rotor Assembly

# CURRENT TRANSFORMER ASSEMBLY

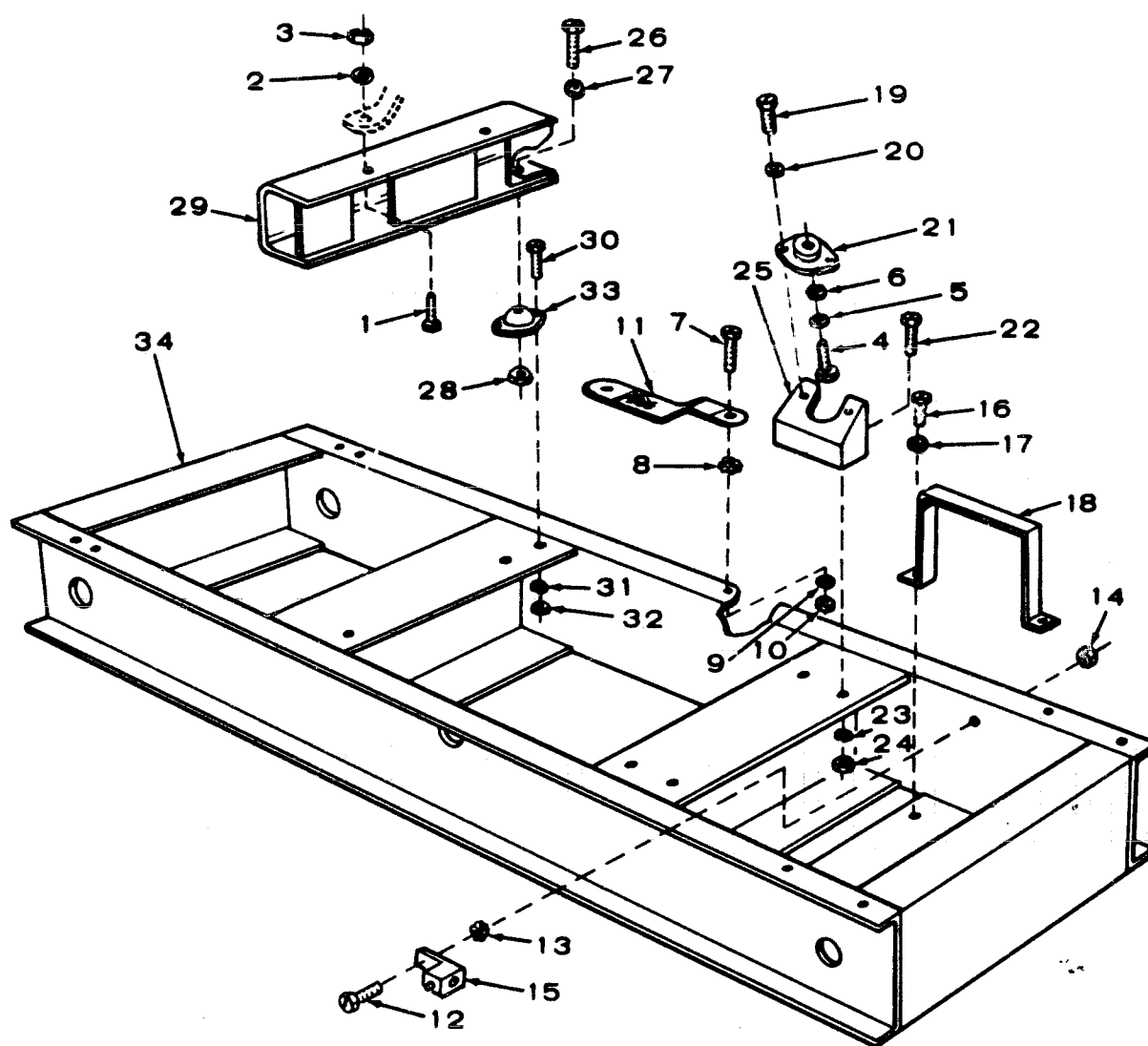


SC-1150

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
CURRENT TRANSFORMER ASSEMBLY (Select Components as Required)			
1	GROUND TERMINAL ASSEMBLY (Includes Following Items)		
	815-0203	1	Screw, Machine - Round Head, Brass (#10-32 x 7/8")
	871-0010	3	Nut, Hex - Brass (#10-32)
	856-0003	1	Washer, Lock - EIT (#10)
	854-0010	2	Washer, Lock - IT (#10)
	526-0049	2	Washer, Flat - Brass (13/64" ID x 7/32" OD x 1/32" Thk)
2	813-0110	6	Screw, Machine - Round Head (#10-32 x 2)
3	854-0010	6	Washer, Lock - IT (#10)
4	302-0235	3	Clamp, Upper
5	302-0236	3	Clamp, Lower
6	302-0253	6	Shim

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
7	CURRENT TRANSFORMER (Select Size as Required)		
	302-0117	3	Ratio 50/5, 3 VA
	302-0076	3	Ratio 75/5, 2 VA
	302-0078	3	Ratio 100/5, 2 VA
	302-0079	3	Ratio 150/5, 1 VA
	302-0106	3	Ratio 200/5, 1 VA
	302-0209	3	Ratio 230/5, 1 VA
	302-0107	3	Ratio 300/5, 1 VA
8	813-0100	6	Screw, Machine - Round Head (#10-32 x 1/2")
9	526-0008	6	Washer, Flat (13/64" ID x 7/16" OD x 1/32" Thk)
10	856-0003	6	Washer, Lock - EIT (#10)
11	870-0053	6	Nut, Hex (#10-32)
12	CURRENT TRANSFORMER (Select Size as Required)		
	302-0952	3	Ratio 75/5, 2 VA
	302-0864	3	Ratio 150/5, 2 VA
	302-0865	3	Ratio 200/5, 2 VA
	302-0866	3	Ratio 250/5, 2 VA
	302-0608	3	Ratio 400/5, 2 VA
	302-0547	3	Ratio 500/5, 2 VA
	302-0471	3	Ratio 750/5, 2 VA
13	302-0729	1	Bracket, Mounting - Transformer
14	302-0764	1	Bracket, Mounting - Transformer

# CHASSIS



M-1177

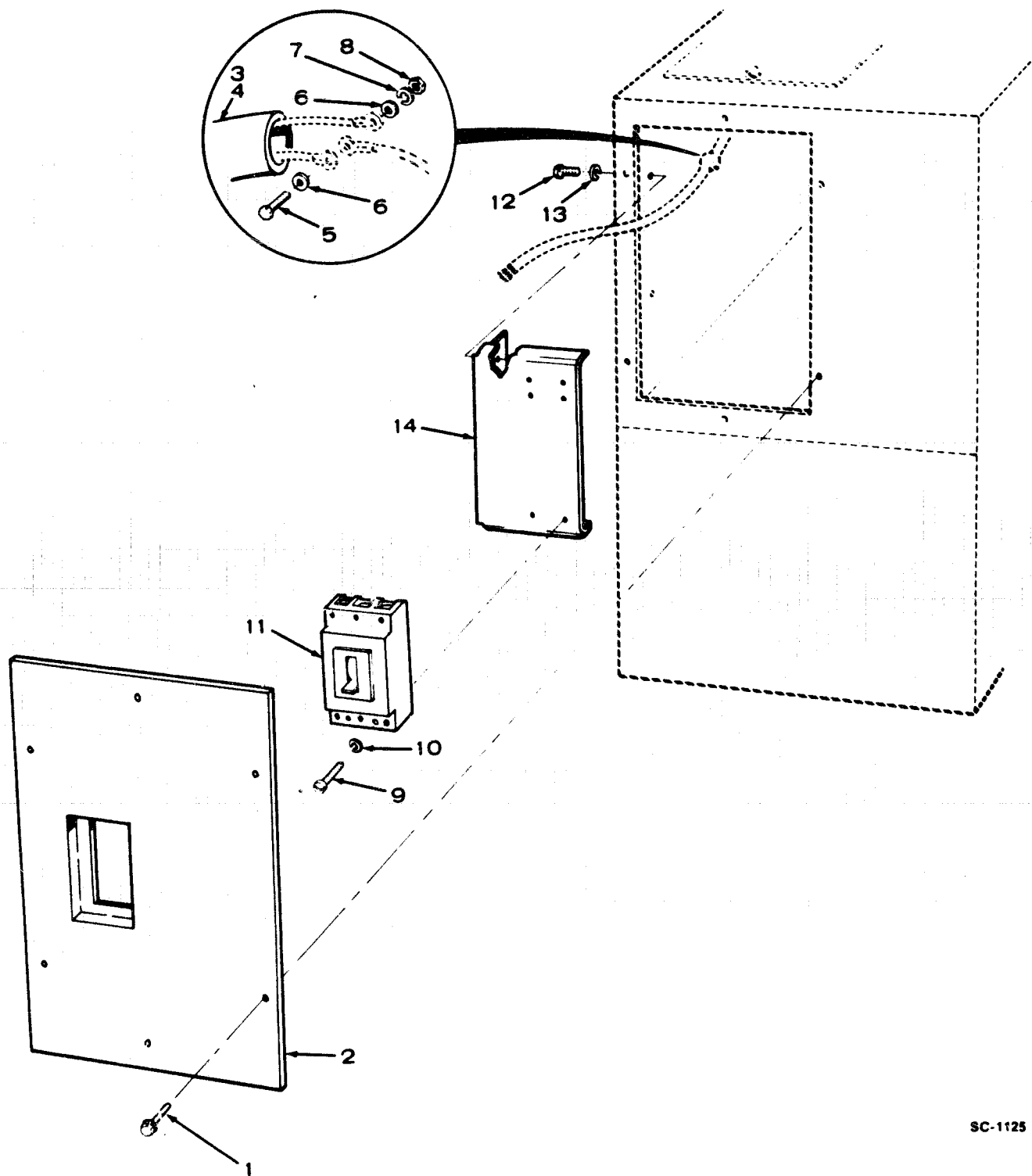
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	800-0138	2	Screw, Cap - Hex Head (5/8-11 x 3")	17	850-0045	2	Washer, Lock - Spring (5/16-18)
2	850-0070	2	Washer, Lock - Spring (5/8")	18	416-0635	1	Strap, Holddown - Battery
3	862-0007	2	Nut, Hex (5/8-11)	19	800-0090	4	Screw, Cap - Hex Head (1/2-13 x 1")
4	800-0163	2	Screw, Cap - Hex Head (3/4-10 x 4")	20	850-0060	4	Washer, Lock - Spring (1/2")
5	526-0238	2	Washer, Flat (13/16"ID x 2"OD x 3/16"Thk)	21	402-0384	2	Mount, Vibration - Generator
6	850-0079	2	Washer, Lock - Spring (3/4")	22	800-0132	4	Screw, Cap - Hex Head (5/8-11 x 1-1/2")
7	800-0092	1	Screw, Cap - Hex Head (1/2-13 x 1-1/2")	23	850-0070	4	Washer, Lock - Spring (5/8")
8	856-0013	1	Washer, Lock - EIT (1/2")	24	862-0007	4	Nut, Hex (5/8-11)
9	850-0060	1	Washer, Lock - Spring (1/2")	25	23C-2208	2	Bracket, Mounting - Generator
10	862-0016	1	Nut, Hex (1/2-13)	26	800-0153	2	Screw, Cap - Hex Head (3/4-10 x 1-1/2")
11	337-0090	1	Strap, Ground	27	850-0079	2	Washer, Lock - Spring (1/4")
12	800-0028	1	Screw, Cap - Hex Head (5/16-18 x 1")	28	862-0008	2	Nut, Hex (3/4-10)
13	856-0008	1	Washer, Lock - EIT (5/16")	29	403-0964	1	Support, Mounting - Engine
14	870-0257	1	Nut, Self-Locking, Hex (5/16-18)	30	800-0092	4	Screw, Cap - Hex Head (1/2-13 x 1-1/2")
15	332-1473	1	Lug, Terminal - Solderless	31	850-0060	4	Washer, Lock - Spring (1/2")
16	800-0035	2	Screw, Cap - Hex Head (5/16-18 x 2-1/2")	32	862-0016	4	Nut, Hex (1/2-13)
				33	402-0371	2	Mount, Vibration - Engine
				34	BASE, SKID 403-1131 403-0963	1	Begin Spec J
						1	Spec F through H

## **OPTIONAL EQUIPMENT SECTION**

This section contains parts listing of factory installed options.

**NOTE:** options may not be applicable to all models; for field installations, additional parts are usually required.

## OPTIONAL CIRCUIT BREAKER



SC-1125

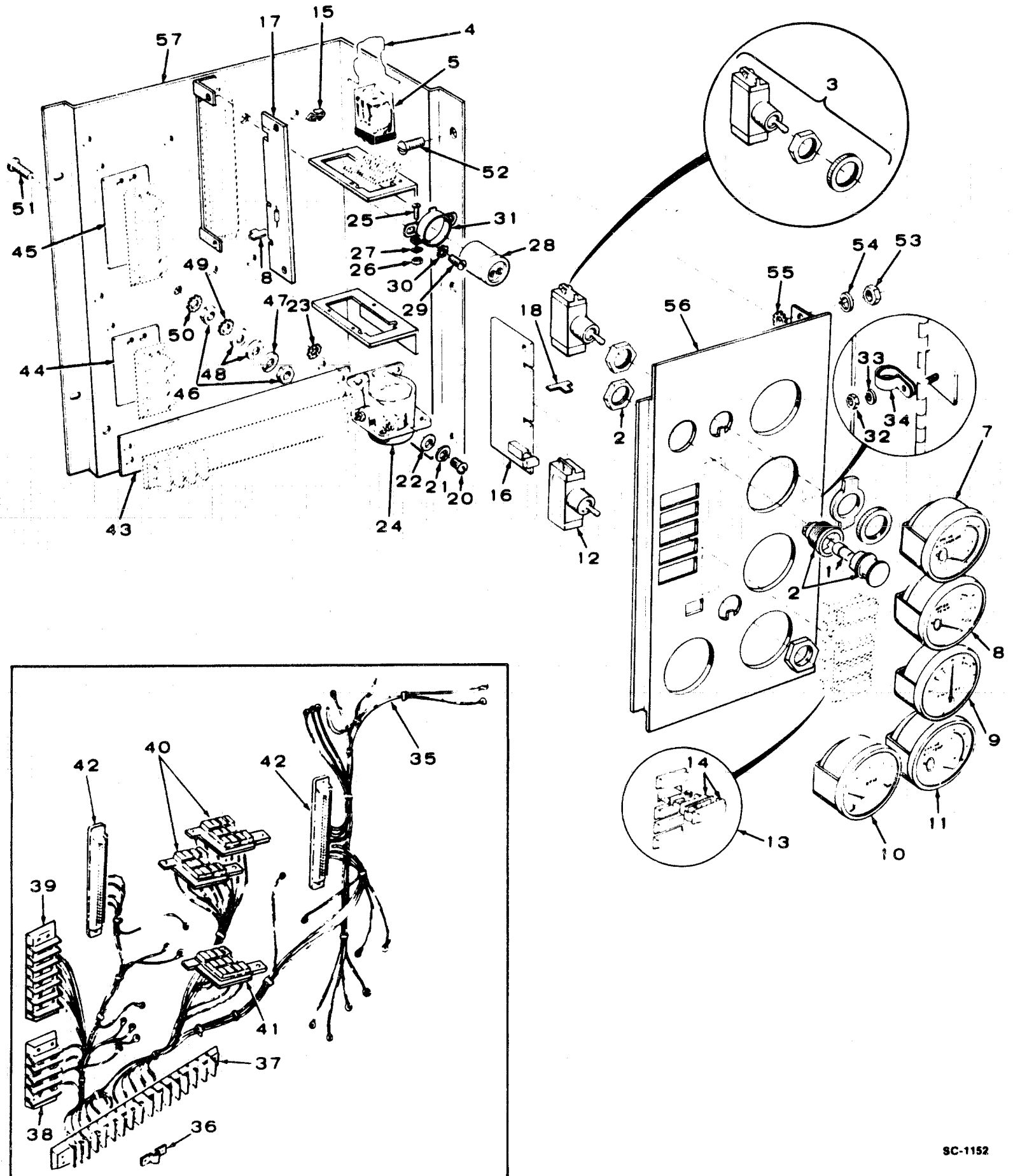
## OPTIONAL CIRCUIT BREAKER

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	815-0350	6	Screw, Tapping - Hex Washer Head (#10-32 x 3/8")
2	301-3192	1	Panel, Cover - Circuit Breaker
3	SLEEVING, INSULATION - SHRINKABLE (Select as Required)		
	898-0863		3/4" ID
	898-0865		1" ID
	898-0875		1-1/2" ID
	898-0869		2" ID
4	SLEEVING, INSULATION - FIBERGLASS (Select as Required)		
	898-0974		3/4" ID
	898-0976		1" ID
5	800-0028	5	Screw, Cap - Hex Head (5/16-18 x 1")
6	526-0022	10	Washer, Flat (21/64" ID x 9/16" OD x 1/16" Thk)
7	850-0045	5	Washer, Lock - Spring (5/16")
8	862-0015	5	Nut, Hex (5/16-18)
9	812-0094	4	Screw, Machine - Round Head (#8-32 x 3-5/8")
10	850-0025	4	Washer, Lock - Spring (#8)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
11	CIRCUIT BREAKER (Select as Required)		
	<b>40-50-60 AMP</b>		
	320-0415	1	40 AMP, 3 PH, 347/600 VAC
	320-0413	1	50 AMP, 3 PH, 277/480 VAC
	320-0384	1	60 AMP, 3 PH, 200/346 - 220/380 VAC
	320-0416	1	60 AMP, 3 PH, 347/600 VAC
	<b>70-90-100 AMP</b>		
	320-0414	1	70 AMP, 3 PH, 277/480 VAC
	320-0417	1	70 AMP, 3 PH, 347/600 VAC
	320-0411	1	90 AMP, 3 PH, 120/240 VAC
	320-0379	1	90 AMP, 3 PH, 200/346 - 220/380 - 277/480 VAC
	320-0418	1	90 AMP, 3 PH, 347/600 VAC
	320-0412	1	100 AMP, 3 PH, 120/208 VAC
	320-0380	1	100 AMP, 3 PH, 200/346 - 220/380 - 277/480 VAC
	320-0771	1	100 AMP, 3 PH, 127/220 VAC with 24 VDC shunt trip and AUX contacts
	<b>125 AMP</b>		
	320-0419	1	125 AMP, 3 PH, 200/346 - 220/380 VAC
	<b>150 AMP</b>		
	320-0346	1	150 Amp, 3 PH, 120/208 - 120/240 VAC
	320-0425	1	150 AMP, 3 PH, 200/346 VAC
	320-0772	1	150 AMP, 3 PH, 127/220 VAC with 12 VDC shunt trip and AUX contacts
	<b>175 AMP</b>		
	320-0344	1	175 AMP, 1 PH, 120/240 VAC
	320-0347	1	175 AMP, 3 PH, 120/208 - 120/240 VAC
	320-0773	1	175 AMP, 3 PH, 127/220 VAC with 12 VDC shunt trip and AUX contacts
	<b>200 AMP</b>		
	320-0348	1	200 AMP, 3 PH, 120/208 - 120/240 VAC
	<b>225 AMP</b>		
	320-0359	1	225 AMP, 1 PH, 120/240 VAC
	320-0349	1	225 AMP, 3 PH, 120/208 VAC
12	800-0003	2	Screw, Cap - Hex Head (1/4-20 x 1/2")
13	850-0040	2	Washer, Lock - Spring (1/4")
14	301-3197	1	Bracket, Mounting - Circuit Breaker



# OPTIONAL ENGINE CONTROL WITH FIVE FAULT LIGHTS



# OPTIONAL ENGINE CONTROL WITH FIVE FAULT LIGHTS

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	322-0004	1	Lamp incandescent (12 VDC)
2	322-0149	1	Lampholder
3	308-0002	1	Switch, Toggle (SPST)
4	307-1157	3	Spring, Holddown - Relay
5	RELAY (12 VDC)		
	307-1058	1	(Ignition)
	307-1058	1	(Start Disconnect)
	307-1061	1	(Starter Protection)
7	GAUGE, OIL PRESSURE		
	193-0243	1	Begin Spec K
	193-0107	1	Specs F Through J
8	GAUGE, WATER TEMPERATURE		
	193-0245	1	Begin Spec K
	193-0106	1	Specs F Through J
9	302-0061	1	Ammeter
10	302-0749	1	£Tachometer - Electrical
11	£GAUGE, OIL TEMPERATURE		
	193-0248	1	Begin Spec K
	193-0187	1	Specs F Through J
12	SWITCH, TOGGLE - SELECTOR		
	308-0138	1	Standard & Cycle Cranking Controls
	308-0327	1	Penn State Controls
13	*LIGHT, INDICATOR (Lens Color & Legend Listed Below)		
	322-0107	1	Red - OVERCRANK
	322-0111	1	Red - OVERSPEED
	322-0108	1	Red - LO OIL PRESS
	322-0109	1	Red - HI ENG TEMP
	322-0110	2	Red - LO ENG TEMP
14	322-0136	1	*Light, Indicator - 14 VDC (Red Lens - No Legend)
15	518-0374	4	Fastener, Snap-In (Printed Circuit Boards)
16	PRINTED CIRCUIT BOARD ASSEMBLY		
	300-0733	1	Standard Cranker (12 VDC)
	300-0714	1	Cycle Cranker (12 VDC)
17	PRINTED CIRCUIT BOARD ASSEMBLY		
	300-0681	1	Engine Control Monitor - Standard
18	332-1276	4	Plug, Keying - PC Board
20	813-0098	2	Screw, Machine - Round Head (#10-32 x 3/8")
21	850-0030	2	Washer, Lock - Spring (#10)
22	526-0009	2	Washer, Flat (7/32" ID x 1/2" OD x 1/16" Thk)
23	856-0003	2	Washer, Lock - EIT (#10)
24	307-1031	1	Relay, Solenoid - Start (12 VDC)
25	812-0061	1	Screw, Machine - Round Head (#6-32 x 3/8")
26	860-0006	1	Nut, Hex (#6-32)
27	853-0003	1	Washer, Lock - ET (#6)
28	356-0072	1	Capacitor, Fixed Electrolytic (4000 MFD, 30 VDC)
29	812-0063	2	Screw, Machine - Round Head (#6-32 x 1/2")

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
30	853-0003	2	Washer, Lock - ET (#6)
31	356-0070	1	Clamp, Capacitor Mounting
32	870-0053	1	Nut, Hex (#10-32)
33	850-0030	1	Washer, Lock - Spring (#10)
34	332-0051	1	Clamp, Loop
35	HARNESS, WIRING - ENGINE CONTROL (Includes Parts Marked †)		
	338-1066	1	Begin Spec K
	338-0534	1	Specs F Through J
	ATTACHING HARDWARE FOR WIRING HARNESS		
	812-0063	6	Screw, Machine - Round Head (#6-32 x 1/2")
	812-0066	6	Screw, Machine - Round Head (#6-32 x 3/4")
	853-0003	14	Washer, Lock - ET (#6)
	860-0006	10	Nut, Hex (#6-32)
36	332-1043	1	†Jumper, Terminal
37	332-0795	1	†Block, Terminal - 16 Place
38	332-0537	1	†Block, Terminal - 4 Place
39	332-0699	1	†Block, Terminal - 6 Place
40	323-0765	2	†Socket, Relay - 11 Place
41	323-0764	2	†Socket, Relay - 8 Place
42	332-1271	1	†Connector, Electrical - PC BD
43	332-1559	1	Strip, Marker - Terminal
44	332-1239	1	Strip, Marker - Terminal
45	332-1240	1	Strip, Marker - Terminal
	GROUND TERMINAL ASSEMBLY (Includes Parts Marked #)		
46	871-0010	2	#Nut, Hex - Brass (#10-32)
47	850-0030	1	#Washer, Lock - Spring (#10)
48	856-0003	2	#Washer, Flat - Brass (13/64" ID x 1/2" OD x 1/16" Thk)
49	853-0008	1	#Washer, Lock - ET (#10)
50	856-0003	1	#Washer, Lock - EIT (#10)
51	815-0203	1	#Screw, Machine - Round Head Brass (#10-32 x 7/8")
52	815-0026	5	Screw, Machine - Truss Head (#10-32 x 3/8")
53	870-0053	1	Nut, Hex (#10-32)
54	850-0030	1	Washer, Lock - Spring (#10)
55	856-0003	1	Washer, Lock - EIT (#10)
56	PANEL, CONTROL - ENGINE		
	301-3267	1	With Three Gauge Mtg. Holes
	301-3286	1	With Four Gauge Mtg. Holes
	301-3166	1	With Five Gauge Mtg. Holes
57	301-3253	1	Bracket, Mounting Engine Control

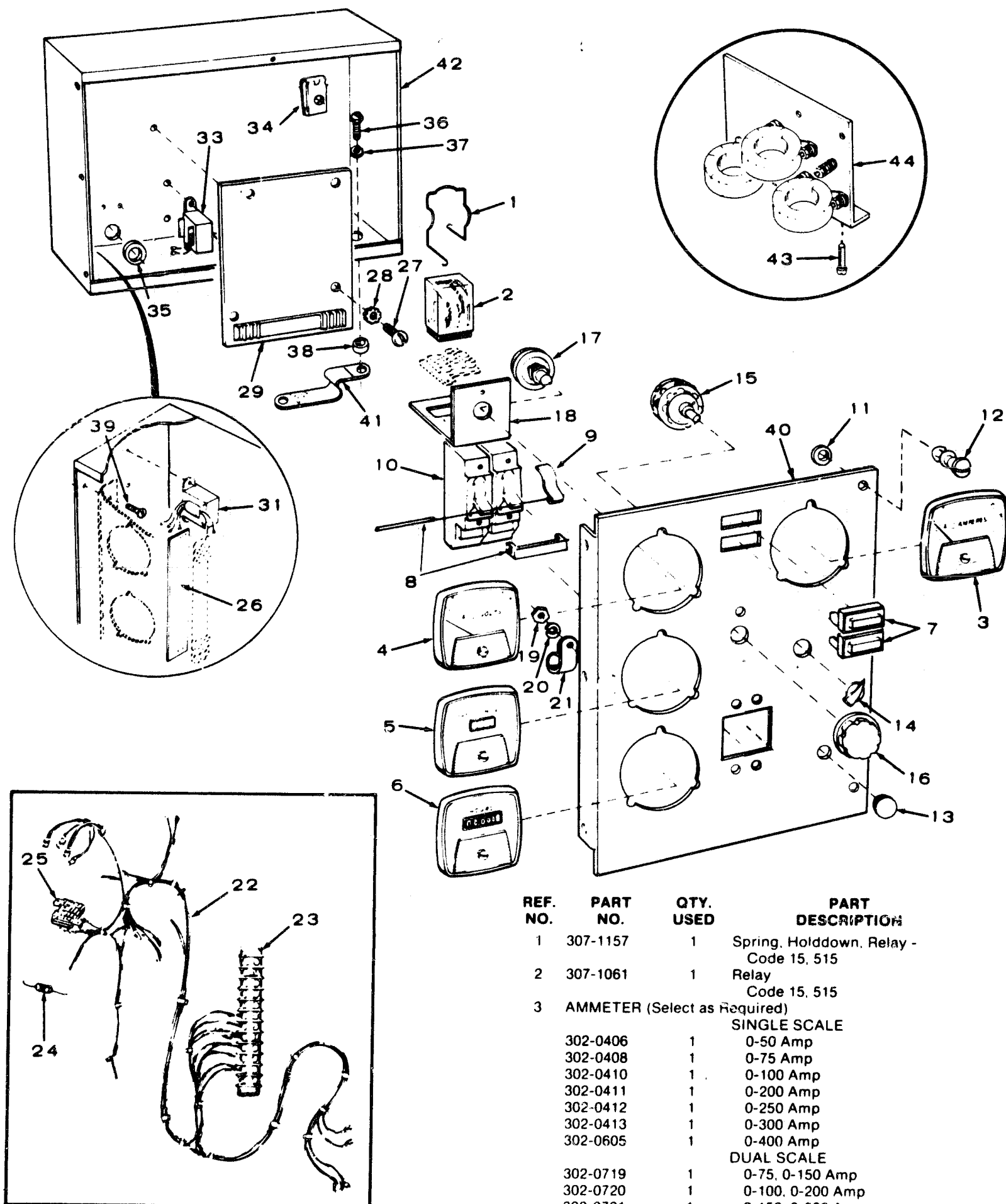
\* - Note: For lamp replacement order 322-0136 remove and discard plain red lens, install lens with legend from burned out light—lights snap in and out of panel.

£ - Optional items used with Engine Mounted Senders.

† - Parts included in Wiring Harness.

# - Parts included in Ground Terminal Assembly.

# **OPTIONAL GENERATOR CONTROL (WITH SWITCHING REGULATOR)**



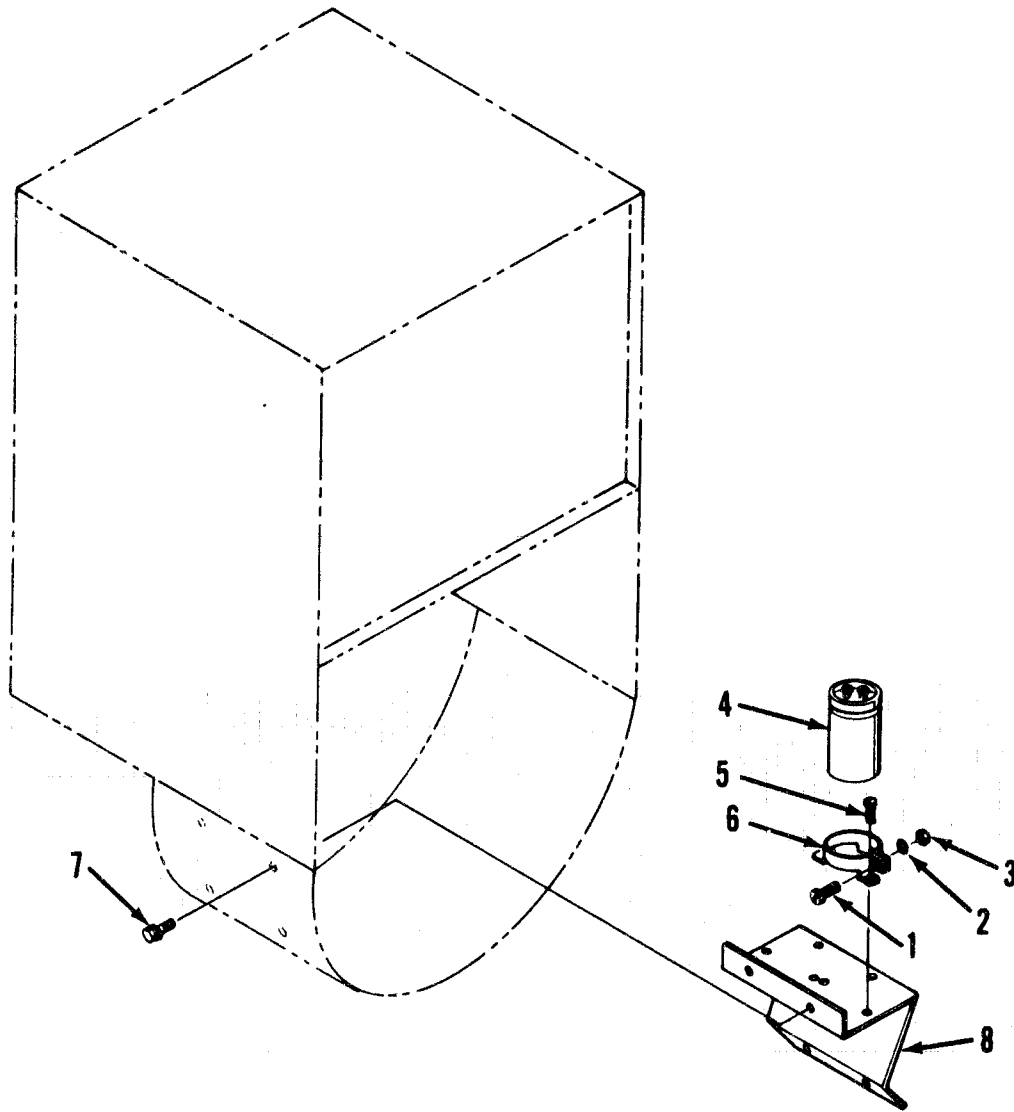
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	307-1157	1	Spring, Holddown, Relay - Code 15, 515
2	307-1061	1	Relay Code 15, 515
3	AMMETER (Select as Required)		
			SINGLE SCALE
	302-0406	1	0-50 Amp
	302-0408	1	0-75 Amp
	302-0410	1	0-100 Amp
	302-0411	1	0-200 Amp
	302-0412	1	0-250 Amp
	302-0413	1	0-300 Amp
	302-0605	1	0-400 Amp
			DUAL SCALE
	302-0719	1	0-75, 0-150 Amp
	302-0720	1	0-100, 0-200 Amp
	302-0721	1	0-150, 0-300 Amp
	302-0722	1	0-200, 0-400 Amp
	302-0723	1	0-250, 0-500 Amp
	302-0724	1	0-375, 0-750 Amp

# OPTIONAL GENERATOR CONTROL (WITH SWITCHING REGULATOR)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
4	VOLTMETER (Select as Required)			23	BLOCK, TERMINAL (Select as Required)		
			SINGLE SCALE		332-0607	1	12 Place
	302-0421	1	0-300 Volt		332-0795	1	16 Place
	302-0422	1	0-600 Volt	24	350-0556	1	Resistor, Fixed, Composition (47K Ohms, 1/2 Watt) - Code 15, 515
	302-0612	1	0-500 Volt				
	302-0779	1	0-750 Volt	25	323-0765	1	Socket, Relay - 11 Place - Code 15, 515
			DUAL SCALE				
	302-0718	1	0-300, 0-600 Volt	26	STRIP, MARKER (Select as Required)		
5	METER, FREQUENCY (Select as Required)				332-1242	1	16 Place
			REED TYPE		332-1248	1	12 Place
	302-0213	1	115 VAC, 60 Hz	27	812-0065	4	Screw, Machine - Round Head (#6-32 x 5/8")
	302-0221	1	230 VAC, 60 Hz				
	302-0234	1	115 VAC, 50 HZ	28	853-0003	4	Washer, Lock - ET (#6)
	302-0256	1	230 VAC, 50 Hz	29	REGULATOR, VOLTAGE (Requires 240 VAC Input Signal)		
			POINTER TYPE		300-1928	1	Semi-Frequency Sensitive Type
	302-0809	1	120 VAC, 60 Hz		300-1929	1	Voltage Sensitive Type
	302-0810	1	208 VAC, 60 Hz		300-1930	1	Frequency Sensitive Type
	302-0811	1	240 VAC, 60 Hz	31	315-0431	1	Transformer, Voltage (240 VAC Output Signal)
6	METER, TIME TOTALIZING (Select as Required)						
	302-0466	1	60 Hz				
	302-0469	1	50 Hz				
7	LIGHT, INDICATOR - 125 VAC (Lens Color & Legend Listed Below)						
	322-0130	1	Red - Lower Scale		ATTACHING PARTS FOR TRANSFORMER		
	322-0131	1	Red - Upper Scale		812-0061	2	Screw, Machine - Round Head (#6-32 x 3/8")
	322-0178	1	*Light, Indicator - 125 VAC (Amber Lens - No Legend)		853-0003	2	Washer, Lock - ET (#6)
8	320-0202	1	Tie Bar - Circuit Breaker				
9	320-0307	1	Lock, Handle - Circuit Breaker (Used On Penn State Sets)	33	315-0384	1	Reactor
10	320-0455	2	Circuit Breaker - 3 Amp, 240 Volt		ATTACHING PARTS FOR REACTOR		
	ATTACHING HARDWARE FOR CIRCUIT BREAKER				812-0061	2	Screw, Machine - Round Head (#6-32 x 3/8")
	812-0061	4	Screw, Machine - Round Head (#6-32 x 3/8")		853-0003	2	Washer, Lock - ET (#6)
	850-0020	4	Washer, Lock - Spring (#6)	34	406-0332	2	Receptacle, Turnbutton Fastener
	815-0203	2	Screw, Machine - Round Head, Brass (#10-32 x 7/8")	35	508-0001	4	Grommet, Rubber
	871-0010	2	Nut, Hex - Brass (#10-32)	36	800-0045	4	Screw, Cap - Hex Head (5/16-18 x 3/8")
	853-0008	2	Washer, Lock - ET (#10)	37	850-0045	4	Washer, Lock - Spring (5/16")
	526-0049	2	Washer, Flat - Brass (13/64" ID x 7/16" OD x 1/32" Thk)	38	402-0070	4	Dampener, Vibration
11	406-0334	2	Clip, Retaining - Turnbutton Fastener	39	815-0026	3	Screw, Machine - Truss Head (#10-32 x 3/8")
12	406-0333	2	Stud, Turnbutton Fastener	40	PANEL CONTROL		
13	517-0131	1	Plug, Plastic				Sets Without Meter Panel
14	303-0076	1	Knob, Pointer		301-3822	1	Code 3
15	308-0284	1	Switch, Selector		301-3821	1	Code 6D, 7, 9X
16	303-0032	1	Knob		301-7078	1	Code 15, 515
17	303-0170	1	Rheostat (35K Ohms, 25 Watt)				Sets With Meter Panel
18	301-3244	1	Bracket, Mounting, Relay - Code 15, 515		301-3169	1	Code 3
19	870-0053	1	Nut, Hex (#10-32)		301-3342	1	Code 6D, 7, 9X
20	850-0030	1	Washer, Lock - Spring (#10)		301-6298	1	Code 15, 515
21	332-0051	1	Clamp, Loop	41	337-0049	1	Strap, Ground
22	HARNESS, WIRING - GENERATOR CONTROL				ATTACHING PARTS FOR STRAP		
			Sets Without Meter Panel		800-0045	1	Screw, Cap - Hex Head (5/16-18 x 3/8")
	338-0765	1	Code 3		850-0045	1	Washer, Lock - Spring (5/16")
	338-0764	1	Code 15, 515		856-0008	2	Washer, Lock - EIT (5/16")
	338-0766	1	Code 6D, 7, 9X		862-0015	1	Nut, Hex (5/16-18)
			Sets With Meter Panel	42	301-3158	1	Box, Control
	338-0735	1	Code 3	43	821-0010	2	Screw, Self-locking - Hex Washer Head (1/4-20 x 1/2")
	338-1469	1	Code 15, 515	44	CURRENT TRANSFORMER ASSEMBLY (See Separate Figure For Parts) - NOTE: Assembly is Located Behind the Control Box.		
	338-0759	1	Code 6D, 7, 9X				
	ATTACHING HARDWARE FOR WIRING HARNESS						
	812-0061	2	Screw, Machine - Round Head (#6-32 x 3/8")				
	812-0066	2	Screw, Machine - Round Head (#6-32 x 3/4")				
	850-0020	2	Washer, Lock - Spring (#6)				
	853-0003	4	Washer, Lock - ET (#6)				
	853-0006	2	Nut, Hex (#6-32)				

\* - NOTE: For lamp replacement order 322-0178. Remove and discard plain red lens, install lens with legend from burned out light — lights snap in and out of panel.

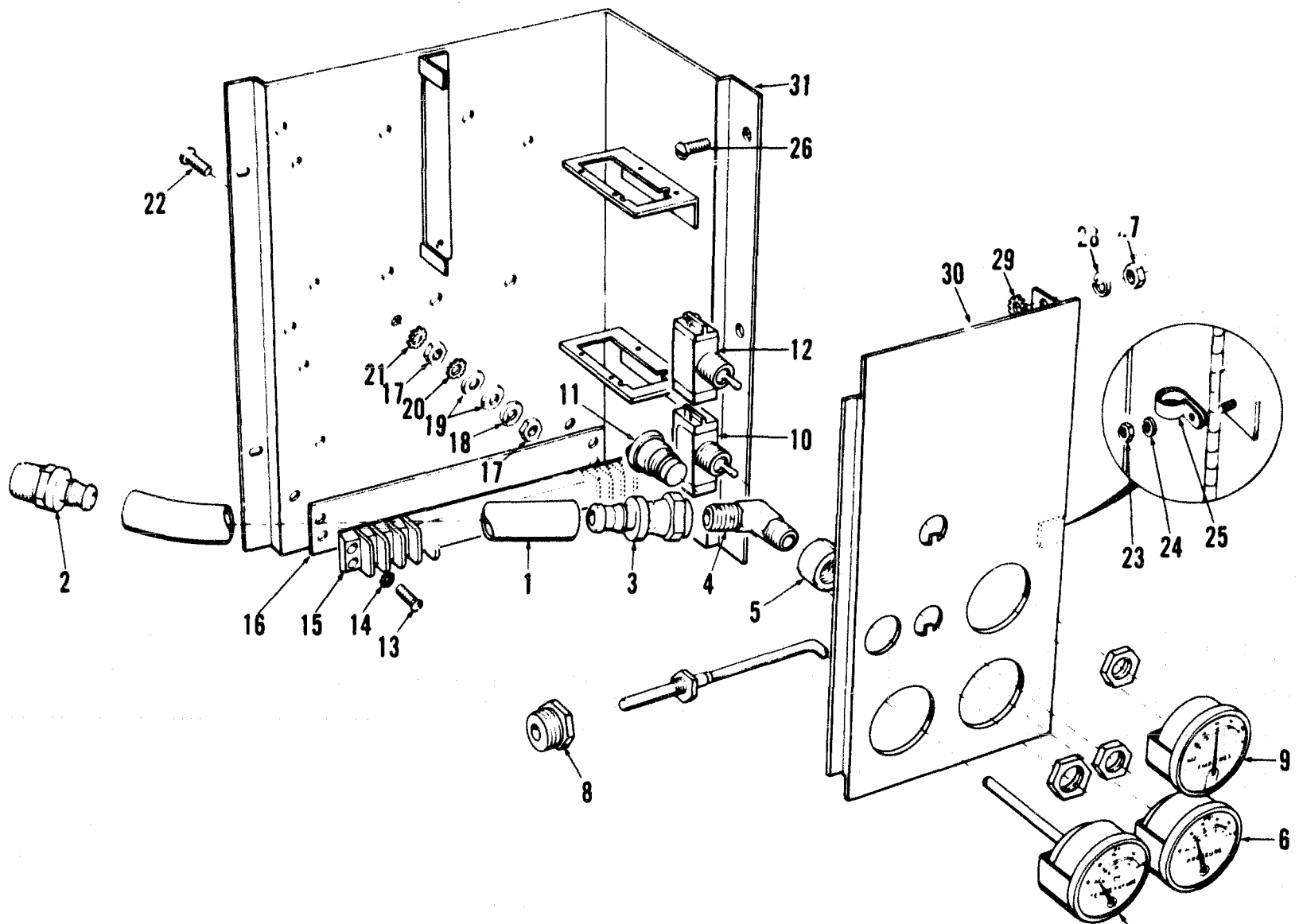
**OPTIONAL  
CAPACITOR ASSEMBLY  
USED WITH  
SWITCHING VOLTAGE REGULATOR**



ES-1357

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	812-0078	2	Screw, Machine - Round Head (#8-32 x 7/16")
2	850-0025	2	Washer, Lock - Spring (#8)
3	861-0007	2	Nut, Square (#8-32)
4	356-0090	2	Capacitor, Fixed, Electrolytic (1300 MFD)
5	812-0078	6	Screw, Machine - Round Head (#8-32 x 7/16")
6	356-0102	2	Clamp, Capacitor Mounting
7	821-0009	4	Screw, Self-Locking - Hex Washer Head (1/4-20 x 3/8")
8	356-0104	1	Bracket, Mounting - Capacitor

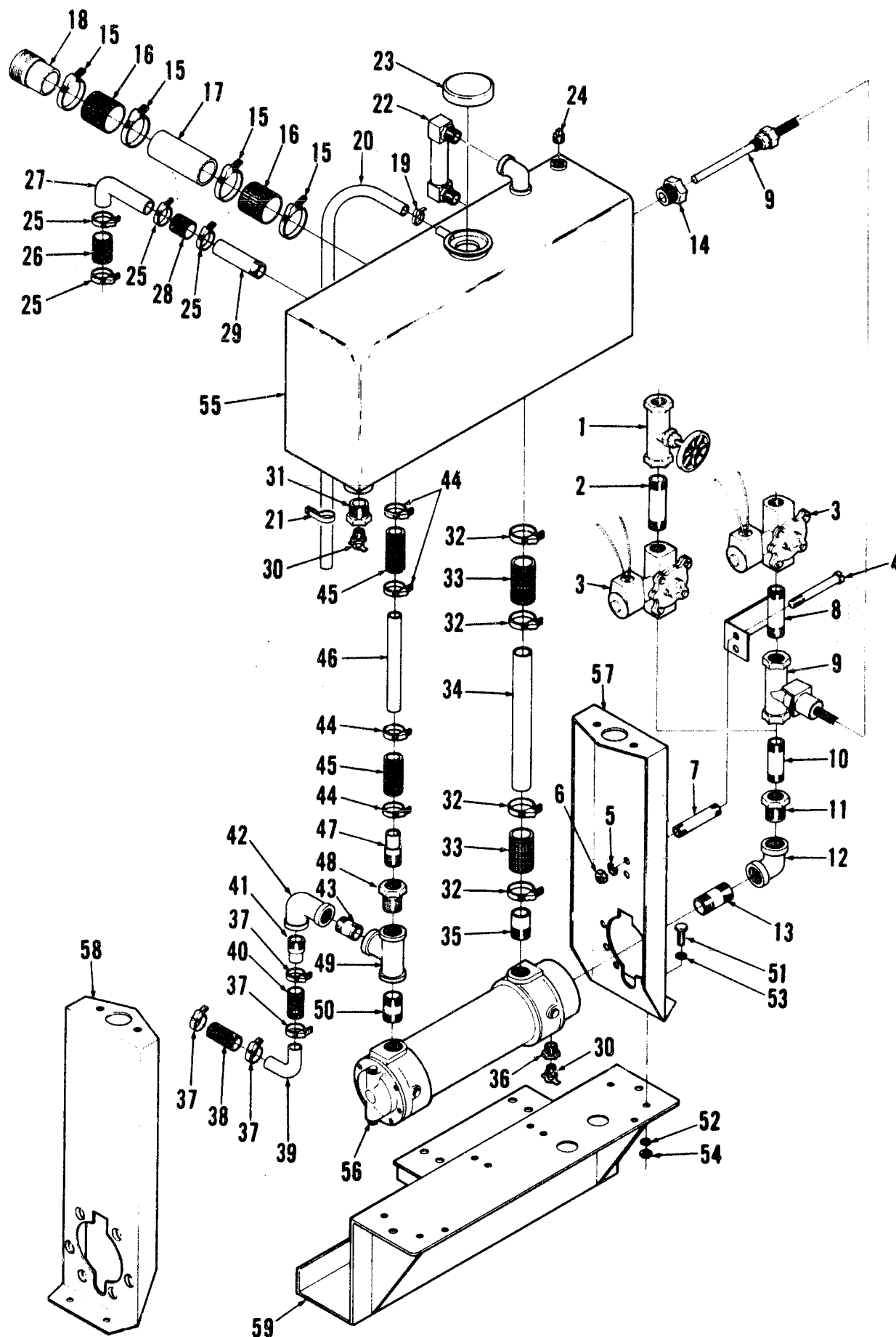
# **OPTIONAL ENGINE CONTROL WITH MECHANICAL GAUGES**



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	503-1077	1	Hose, Rubber - High Pressure (1 1/4" ID x 1 1/2" OD x 96" lg)
2	502-0444	1	Adapter, Pipe to Hose - Male (1/8" NPT x 1/4" ID Hose)
3	502-0445	1	Adapter, Pipe to Hose - Female (7/16-20 UNF x 1/4" ID Hose)
4	502-0583	1	Elbow, Pipe - 45 Deg. (7/16-20 UNF x 1/8" NPT)
5	502-0051	1	Coupling, Pipe (1/8" NPT)
6	GAUGE, OIL PRESSURE (Select as Required)		
	193-0232	1	Scale Range 0 to 75 PSI
	193-0233	1	Scale Range 0 to 150 PSI
7	GAUGE, TEMPERATURE (Select as Required)		
	193-0234	1	With 72" Capillary Tube
	193-0235	1	With 84" Capillary Tube
	193-0236	1	With 96" Capillary Tube
	193-0305	1	With 144" Capillary Tube
8		1	Reducer, Hex (Included with Gauge) (5/8-18 UNF x 1/2" NPT)
9	302-0061	1	Ammeter
10	308-0088	1	Switch, Toggle (DPST)
11	308-0297	1	Switch, Push
12	308-0155	1	Switch, Toggle (SPST)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
13	812-0066	2	Screw, Machine - Round Head (#6-32 x 3/4")
14	853-0003	2	Washer, Lock - ET (#6)
15	332-0795	1	Block, Terminal - 20 Place
16	332-1241	1	Strip, Marker - Terminal
	GROUND TERMINAL ASSEMBLY		
17	871-0010	2	Nut, Hex - Brass (#10-32)
18	850-0030	1	Washer, Lock - Spring (#10)
19	526-0062	2	Washer, Flat - Brass (13/64" ID 1/2" OD x 1/16" Thk)
20	853-0008	1	Washer, Lock - ET (#10)
21	856-0003	1	Washer, Lock - EIT (#10)
22	815-0203	1	Screw, Machine - Round Head, Brass (#10-32 x 7/8")
23	870-0053	1	Nut, Hex (#10-32)
24	850-0030	1	Washer, Lock - Spring (#10)
25	332-0051	1	Clamp, Loop
26	815-0026	5	Screw, Machine - Truss Head (#10-32 x 3/8")
27	870-0053	1	Nut, Hex (#10-32)
28	850-0030	1	Washer, Lock - Spring (#10)
29	856-0003	1	Washer, Lock - EIT (#10)
30	301-4009	1	Panel, Control - Engine
31	301-3253	1	Bracket, Mounting - Engine Control

# **OPTIONAL COOLING SYSTEM WITH HEAT EXCHANGER**



# OPTIONAL COOLING SYSTEM WITH HEAT EXCHANGER

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
HEAT EXCHANGER COOLING SYSTEM (All Parts Common Except as Marked)				27	#	1	Elbow, Tube - 90 Deg
		1	†Without Coolant Temperature Regulator	28	#	1	Hose, Rubber (1-1/4"ID x 2"Lg)
		1	£With Coolant Temperature Regulator	29	505-0381	1	Nipple, Pipe - Half (1"NPT x 4"Lg)
1	504-0051	1	†Valve, Globe (1-1/4"NPT)	30	504-0028	2	Cock, Drain (3/8"NPT)
2	505-0177	1	†Nipple, Pipe - Close (1-1/4"NPT x 1-1/2"Lg)	31	505-0131	1	Bushing, Reducer - Hex 3/4"NPT x 3/8"NPT)
3	307-0849	1	Valve, Control - Solenoid 12 VDC (1-1/4"NPT)	32	503-0429	4	Clamp, Hose
4	812-0162	2	Screw, Machine - Round Head (1/4-20 x 3")	33	#	2	Hose, Rubber (1-7/8"ID x 3"Lg)
5	850-0040	2	Washer, Lock - Spring (1/4")	34	#	1	Tube (1-7/8"OD x 16"Lg)
6	862-0001	2	Nut, Hex (1/4-20)	35	505-0444	1	Nipple, Pipe - Half (1-1/2"NPT x 2-1/2"Lg)
7	505-0104	2	Nipple, Pipe - Close (1/8"NPT x 1-1/2"Lg)	36	505-0019	1	Bushing, Reducer - Hex (1/2"NPT x 3/8"NPT)
8	130-0763	1	Nipple, Support Assembly	37	503-0365	4	Clamp, Hose
9	309-0243	1	£Valve, Control - Temperature Regulating (1-1/4"NPT)	38	#	1	Hose, Rubber (2-1/4"ID x 4"Lg)
10	505-0177	1	Nipple, Pipe - Close (1-1/4"NPT x 1-1/2"Lg)	39	#	1	Elbow, Tube - 90 Deg (2-1/4"OD)
11	505-0025	1	Bushing, Reducer - Hex (1-1/2"NPT x 1-1/4"NPT)	40	#	1	Hose, Rubber (2-1/4"ID x 3"Lg)
12	505-0043	1	Elbow, Pipe - 90 Deg (1-1/2"NPT)	41	#	1	Adapter, Pipe to Hose
13	505-0109	1	Nipple, Pipe (1-1/2"NPT x 2-1/2"Lg)	42	505-0201	1	Elbow, Pipe - 90 Deg (2"NPT)
14	505-0129	1	£Bushing, Reducer - Hex (1"NPT x 3/4"NPT)	43	505-0168	1	Nipple, Pipe - Close (2"NPT x 2-1/2"Lg)
HEAT EXCHANGER & EXPANSION TANK ASSEMBLY				44	503-0398	4	Clamp, Hose
#		1	Built and Installed by Engine Manufacturer (Includes Items 15 through 59)	45	#	2	Hose, Rubber (1-1/8"ID x 3"Lg)
15	503-0365	4	Clamp, Hose	46	#	1	Tube (1-1/8"OD x 10"Lg)
16	#	2	Hose, Rubber (2-1/4"ID x 2-3/8"Lg)	47	#	1	Adapter, Pipe to Hose
17	#	1	Tube (2-1/4"OD x 6-3/8"Lg)	48	505-0024	1	Bushing, Reducer - Hex (1-1/2"NPT x 1"NPT)
18	#	1	Adapter, Pipe to Hose	49	#	1	Tee, Pipe - Reducing (2"NPT x 1-1/2"NPT x 1-1/2"NPT)
19	503-0446	1	Clamp, Hose	50	505-0109	1	Nipple, Pipe (1-1/2"NPT x 2-1/2"NPT)
20	#	1	Hose, Rubber (1/4"ID x 42"Lg)	51	800-0050	8	Screw, Cap - Hex Head (3/8-16 x 1")
21	#	1	Clamp, Loop	52	850-0050	8	Washer, Lock - Spring (3/8")
22	#	1	Gauge, Liquid Level	53	526-0026	8	Washer, Flat (13/32"ID x 3/4"OD x 1/16"Thk)
23	#	1	Cap, Pressure - Tank	54	862-0003	4	Nut, Hex (3/8-16)
24	505-0130	1	Plug, Pipe - Square Head (3/4"NPT)	55	#	1	Tank, Expansion
25	503-0429	4	Clamp, Hose	56	#	1	Heat Exchanger
26	#	1	Hose, Rubber (1-1/4"ID x 3"Lg)	57	#	1	Bracket, Support
				58	#	1	Bracket, Support
				59	#	1	Support, Heat Exchanger

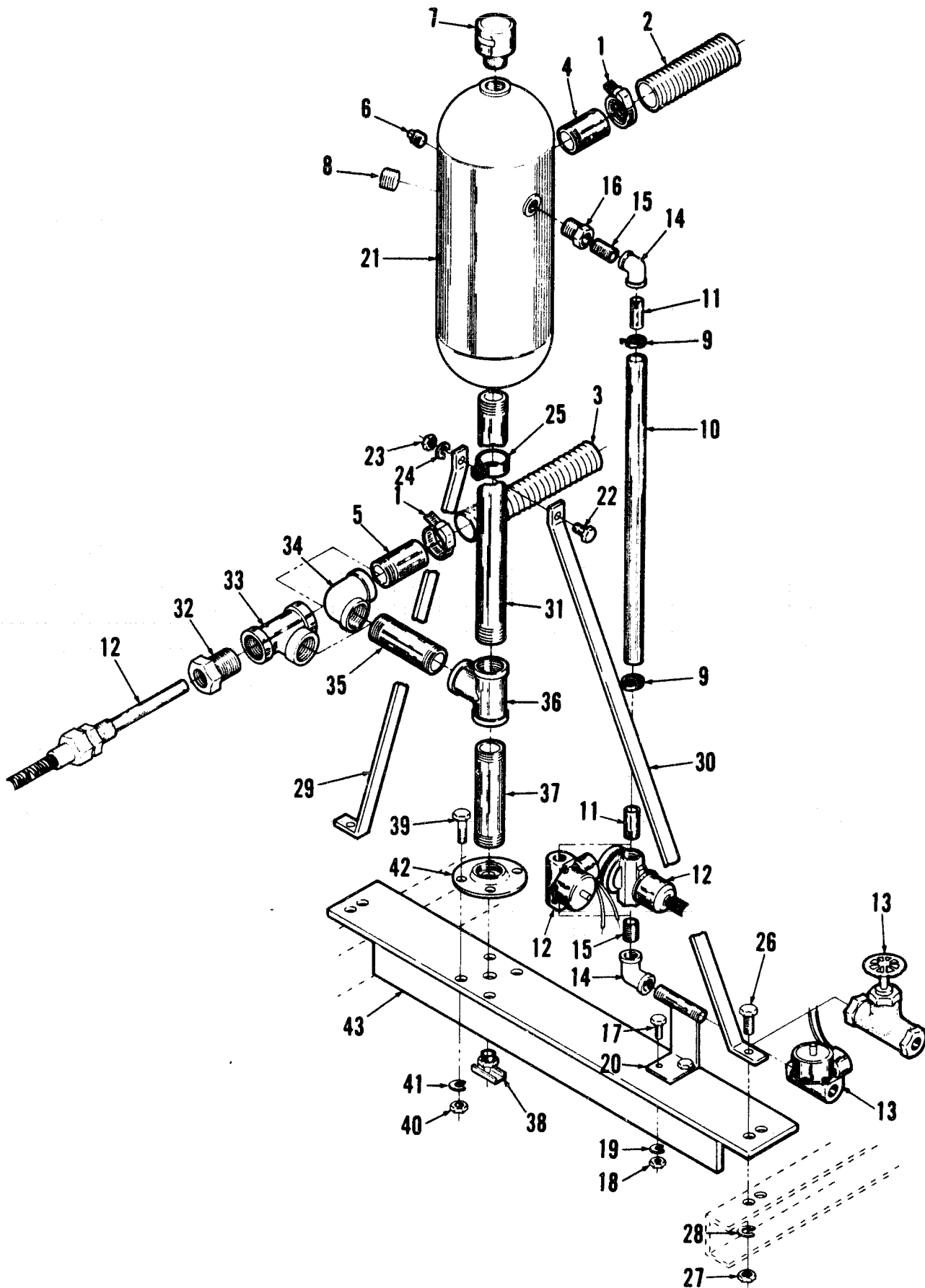
† - Parts Included in Non-Regulated System.

£ - Parts Included in Regulated System.

# - For replacement refer to the Engine Manufacturer.



# **OPTIONAL COOLING SYSTEM WITH STANDPIPE**

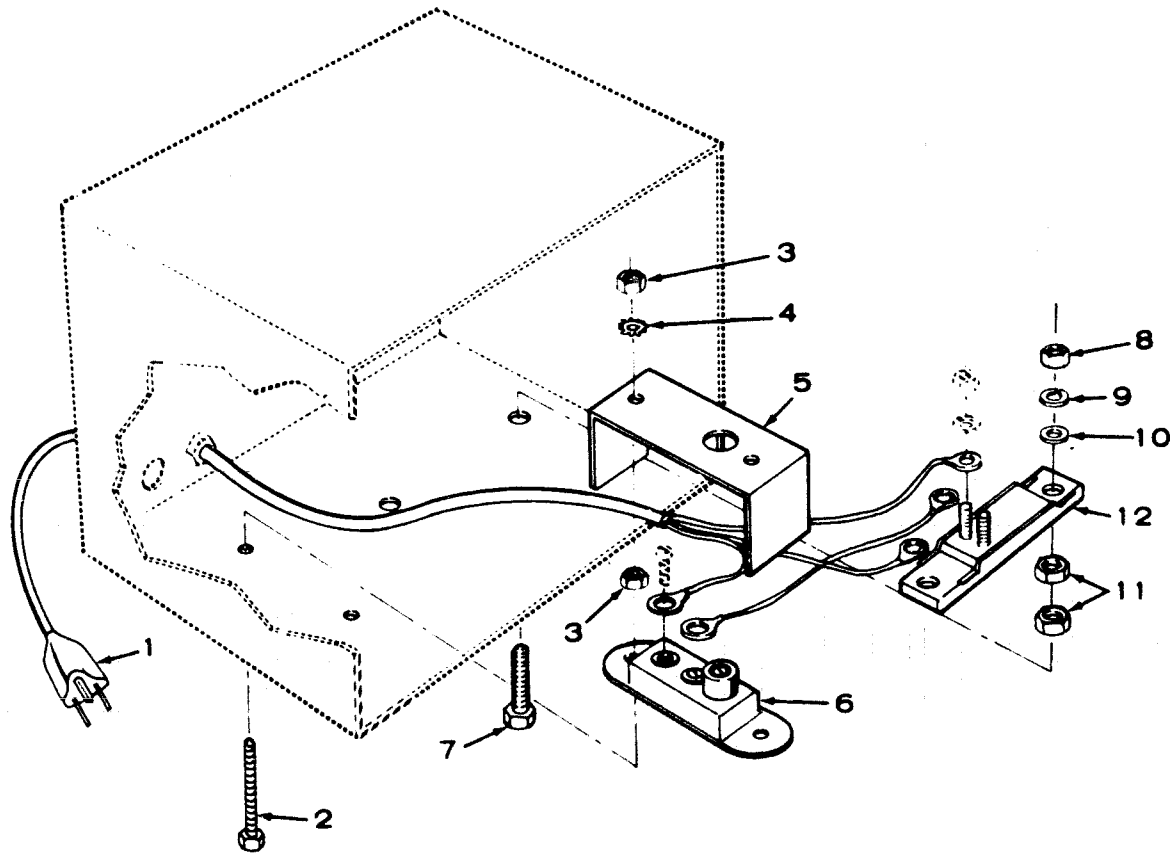


XCS 1237

# OPTIONAL COOLING SYSTEM WITH STANDPIPE

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	COOLING SYSTEM WITH STANDPIPE			18	862-0001	2	Nut, Hex (1/4-20)
		1	With Coolant Temperature Regulator	19	850-0040	2	Washer, Lock - Spring (1/4")
		1	Without Coolant Temperature Regulator	20	110-0810	1	Nipple, Support Assembly
1	503-0189	4	Clamp, Hose	21	130-0425	1	Tank, Standpipe
2	503-0709	1	Hose, Rubber (2-1/4"ID x 9")	22	800-0051	1	Screw, Cap - Hex Head (3/8-16 x 1-1/4")
3	503-0709	1	Hose, Rubber (2-1/4"ID x 9")	23	862-0003	1	Nut, Hex (3/8-16)
4	505-0204	1	Nipple, Pipe - Half (2"NPT x 2")	24	850-0050	1	Washer, Lock - Spring (3/8")
5	505-0380	1	Nipple, Pipe - Half (2"NPT x 3")	25	130-0871	1	Clamp, Loop
6	505-0140	1	Plug, Pipe - Square Head (1"NPT)	26	800-0093	2	Screw, Cap - Hex Head (1/2-13 x 1-)
7	504-0062	1	Valve, Vacuum Relief	27	862-0005	2	Nut, Hex (1/2-13)
8	505-0949	1	Plug, Pipe - Socket Head (1-1/4"NPT)	28	850-0060	2	Washer, Lock - Spring (1/2")
9	503-0189	2	Clamp, Hose	29	130-0870	1	Brace, Support - Standpipe
10	503-0848	1	Hose, Rubber (1"ID x 36")	30	130-0869	1	Brace, Support - Standpipe
11	505-0324	2	Nipple, Pipe - Half (3/4"NPT x 2")	31	505-0746	1	Nipple, Pipe (2"NPT x 19")
12	VALVE, CONTROL			32	505-0351	1	Bushing, Reducer (2"NPT x 3/4"NPT) - Regulating System Only
	309-0241	1	Valve, Control - Temperature Regulating	33	505-0374	1	Tee, Pipe (2"NPT) - Regulating System Only
	307-0835	1	Valve, Control - Solenoid (Non-Regulating System)	34	505-0175	1	Elbow, Pipe - 90 Deg (2"NPT) - Non-Regulating System Only
13	VALVE, CONTROL			35	505-0172	1	Nipple, Pipe (2"NPT x 2")
	307-0835	1	Valve, Control - Solenoid	36	505-0374	1	Tee, Pipe (2"NPT)
	504-0046	1	Valve, Globe (Non-Regulating System)	37	505-0747	1	Nipple, Pipe (2"NPT x 5-1/2")
14	505-0132	2	Elbow, Pipe - 90 Deg (3/4"NPT)	38	504-0006	1	Cock, Drain
15	505-0102	2	Nipple, Pipe - Close (3/4"NPT x 1-3/8")	39	800-0093	6	Screw, Cap - Hex Head (1/2-13 x 1-3/4")
16	505-0297	1	Bushing, Reducer (1-1/4"NPT x 3/4"NPT)	40	862-0005	6	Nut, Hex (1/2-13)
17	800-0007	2	Screw, Cap - Hex Head (1/4-20 x 1")	41	850-0060	6	Washer, Lock - Spring (1/2")
				42	130-0442	1	Base, Standpipe
				43	130-0857	1	Support, Mounting - Standpipe

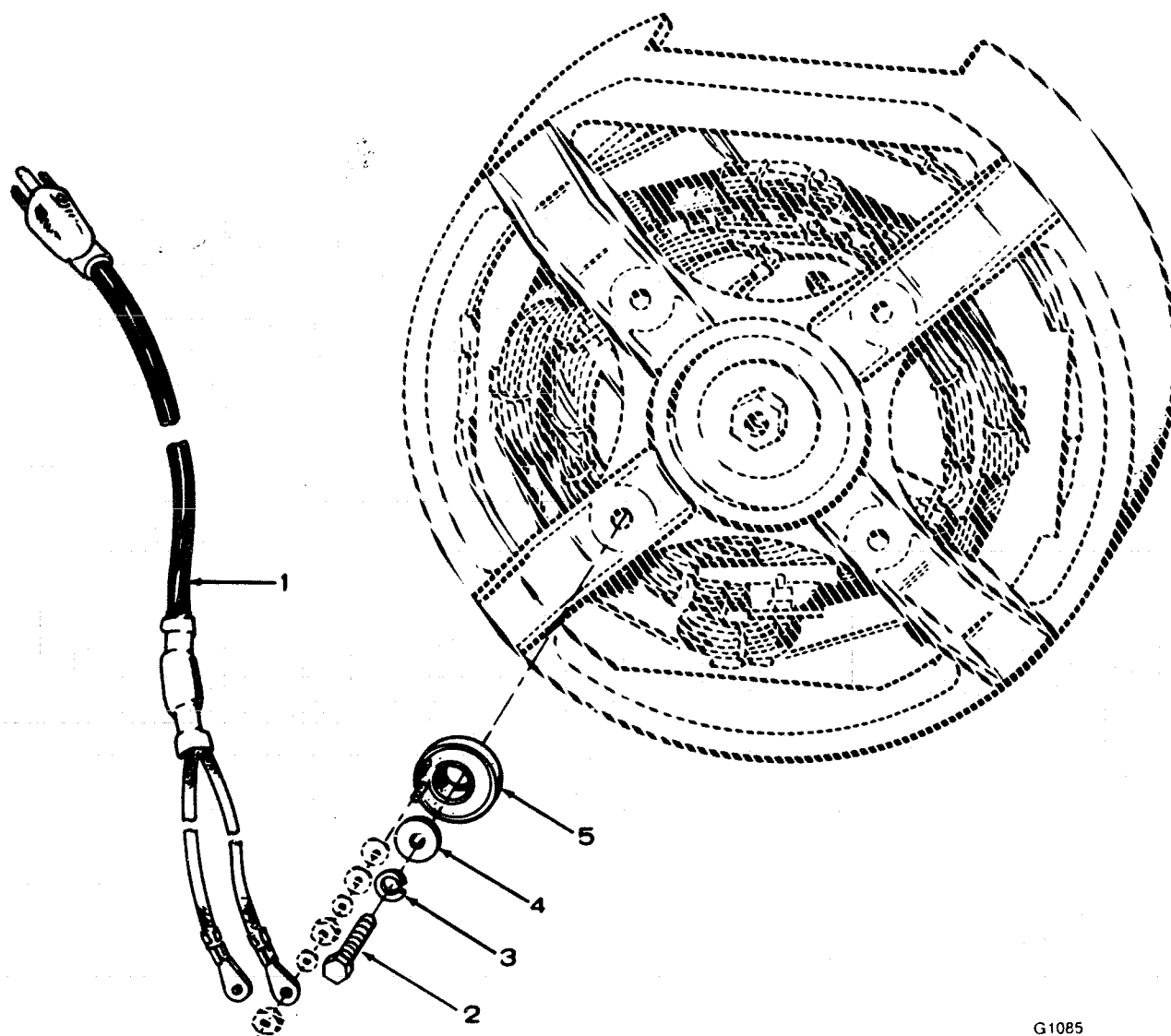
## OPTIONAL CONTROL HEATER



SC-1156

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	335-0110	1	Cable, Electrical (3 Wire)
2	812-0090	2	Screw, Machine - Round Head (#6-32 x 2-1/4")
3	860-0006	4	Nut, Hex (#6-32)
4	856-0001	2	Washer, Lock - EIT (#6)
5	301-1886	1	Cover, Thermostat
6	309-0128	1	Thermostat - Adjustable
7	800-0007	2	Screw, Cap - Hex Head (1/4-20 x 1")
8	862-0001	2	Nut, Hex (1/4-20)
9	850-0040	2	Washer, Lock - Spring (1 4)
10	526-0052	2	Washer, Flat (17/64" ID x 9/16" OD x 1/16" Thk)
11	862-0015	4	Nut, Hex (5/16-18) - Used As Spacers
12	333-0151	1	Heater - 75 Watt, 120 VAC, 300 Watt, 240 VAC

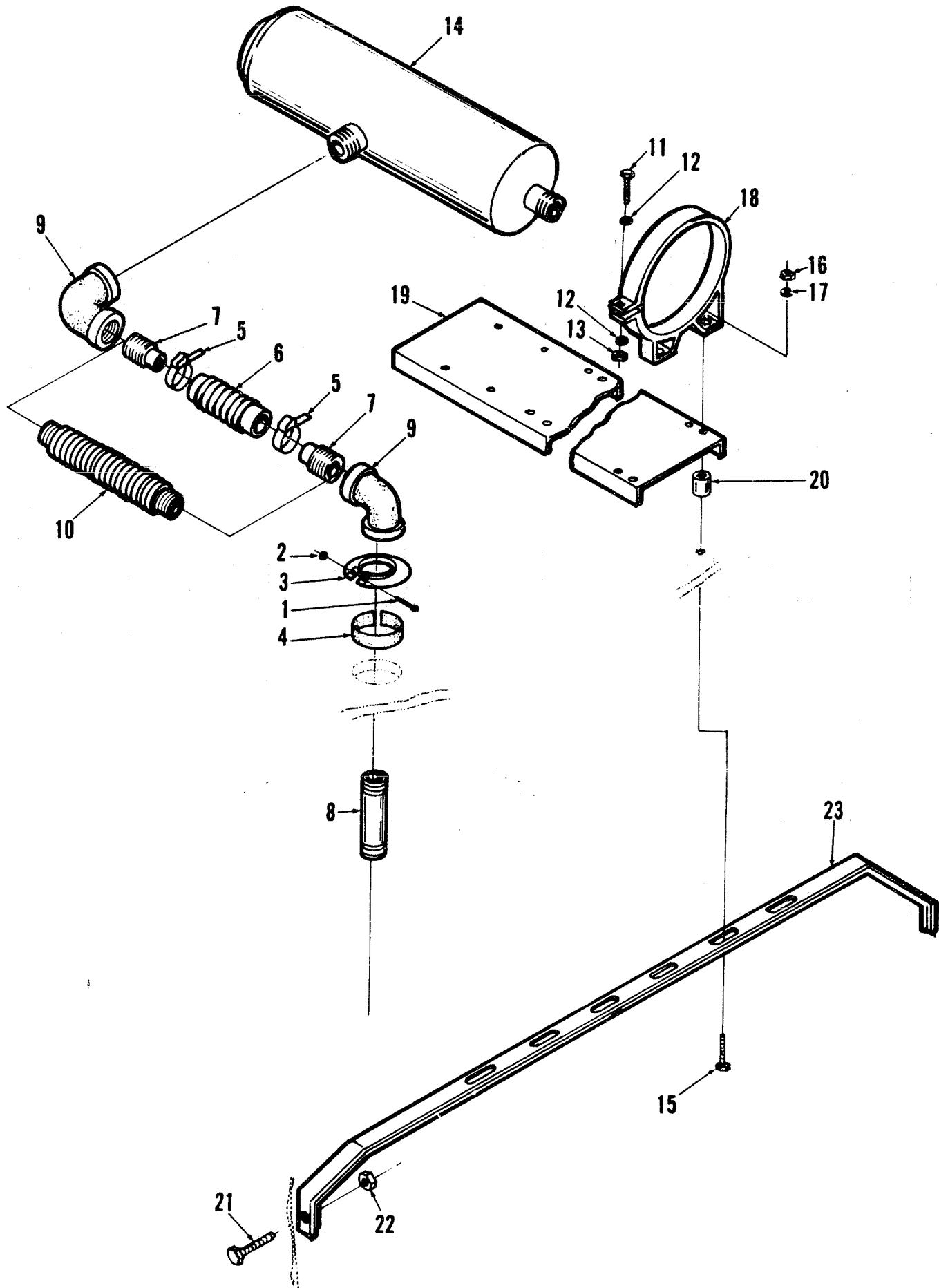
# **OPTIONAL GENERATOR HEATER**



G1085

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	HEATER, GENERATOR		
		1	120 Volt
		1	240 Volt
1	CABLE ASSEMBLY (Includes Thermostat)		
	335-0146	1	120 Volt
	335-0147	1	240 Volt
2	800-0004	1	Screw, Cap - Hex Head (1/4-20 x 5/8")
3	850-0038	1	Washer, Lock - Spring (1/4")
4	526-0158	1	Washer, Flat (17/64" ID 1" OD x 1/8" Thk)
5	HEATER, ELECTRICAL		
	333-0059	1	120 Volt, 125 Watt
	333-0192	1	240 Volt, 200 Watt

**OPTIONAL  
EXHAUST SYSTEM - INDUSTRIAL TYPE  
(HOUSED SETS)**



# OPTIONAL EXHAUST SYSTEM - INDUSTRIAL TYPE (HOUSED SETS)

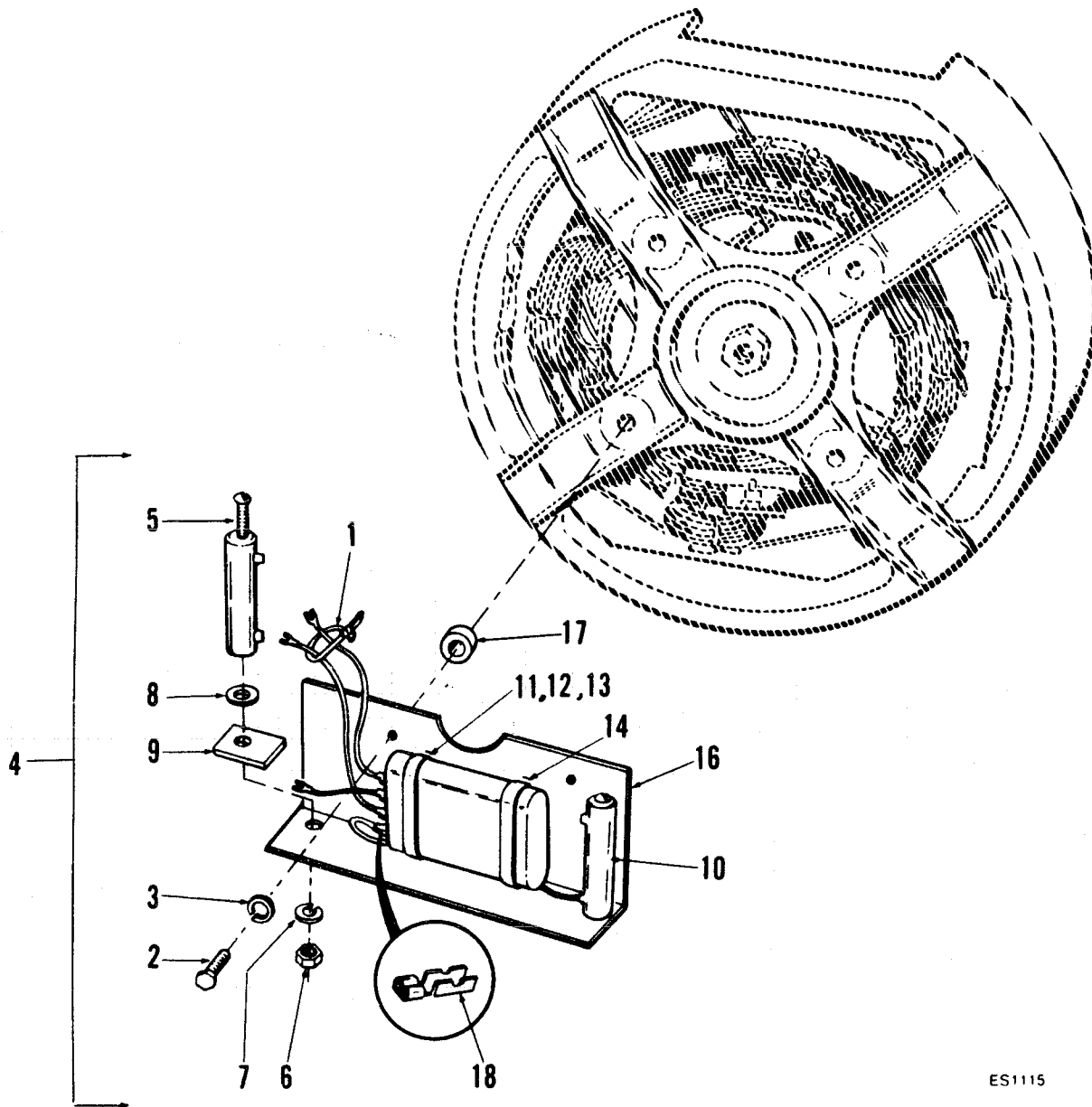
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
EXHAUST SYSTEM (Parts Common except as Marked)			
			HOUSED SETS
		1	* Used up to July 1976
		1	+Used beginning July 1976
1	813-0105	2	Screw, Machine - Round Head (#10-32 x 1")
2	870-0188	2	Nut, Self-locking, Hex (#10-32)
3	155-1422	1	Shield, Rain
4	895-0159	1	Asbestos Strip (2" x 1/16"Thk x 12"Lg)
5	503-0354	2	+Clamp, Hose.
6	155-1465	1	+Tube, Exhaust - Flexible, SST (3" x 18"Lg)
7	155-1463	2	+Connector, Tube - Exhaust (3"NPT)
8	NIPPLE, PIPE		
	505-0679	1	*(3"NPT x 12"Lg)
	505-0660	1	+(3"NPT x 13-1/2"Lg)
9	505-0453	2	*+Elbow, Pipe - 90 Deg (3"NPT)
10	155-1168	1	*Tube, Exhaust - Flexible (3" x 24"Lg)
11	SCREW CAP - HEX (Select as Required)		
	800-0035	3	5/16-18 x 2-1/2"
	800-0036	3	5/16-18 x 2-3/4"
	800-0037	3	5/16-18 x 3"

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
12	526-0113	6	Washer, Flat (11/32"ID x 1"OD x 3/32"Thk)
13	870-0257	3	Nut, Self-locking, Hex Washer Head (5/16-18)
14	155-0989	1	Muffler, Exhaust (14"OD x 50"Lg)
15	SCREW, CAP - HEX HEAD		
	800-0030	4	*5/16-18 x 1-1/4"
	800-0037	4	+5/16-18 x 3"
16	NUT, HEX		
	862-0015	4	*5/16-18
	870-0048	4	+5/16-18, Self-locking
17	850-0045	4	*Washer, Lock - Spring (5/16")
18	BAND, MOUNTING		
	140-0757	2	*(14"ID)
	140-0757	2	+(14"ID)
19	HEATSHIELD		
	155-1164	1	*(12"W x 46"Lg)
	155-1164	1	+(12"W x 46"Lg)
20	SPACER		
	526-0172	4	*(1/2"OD x 2-1/4"OD x 1/4"Thk)
	155-1430		+(1/2"ID x 1-1/2"OD x 2"Thk)
21	800-0030	4	Screw, Cap - Hex Head (5/16-18 x 1-1/4")
22	870-0048	4	Nut, Self-locking, Hex (5/16-18)
23	405-1924	2	Bracket, Support - Muffler Mounting

\* - Parts used only on Sets - Before July 1976

+ - Parts used only on Sets - Beginning July 1976

# OPTIONAL VOLTAGE REGULATOR FILTER

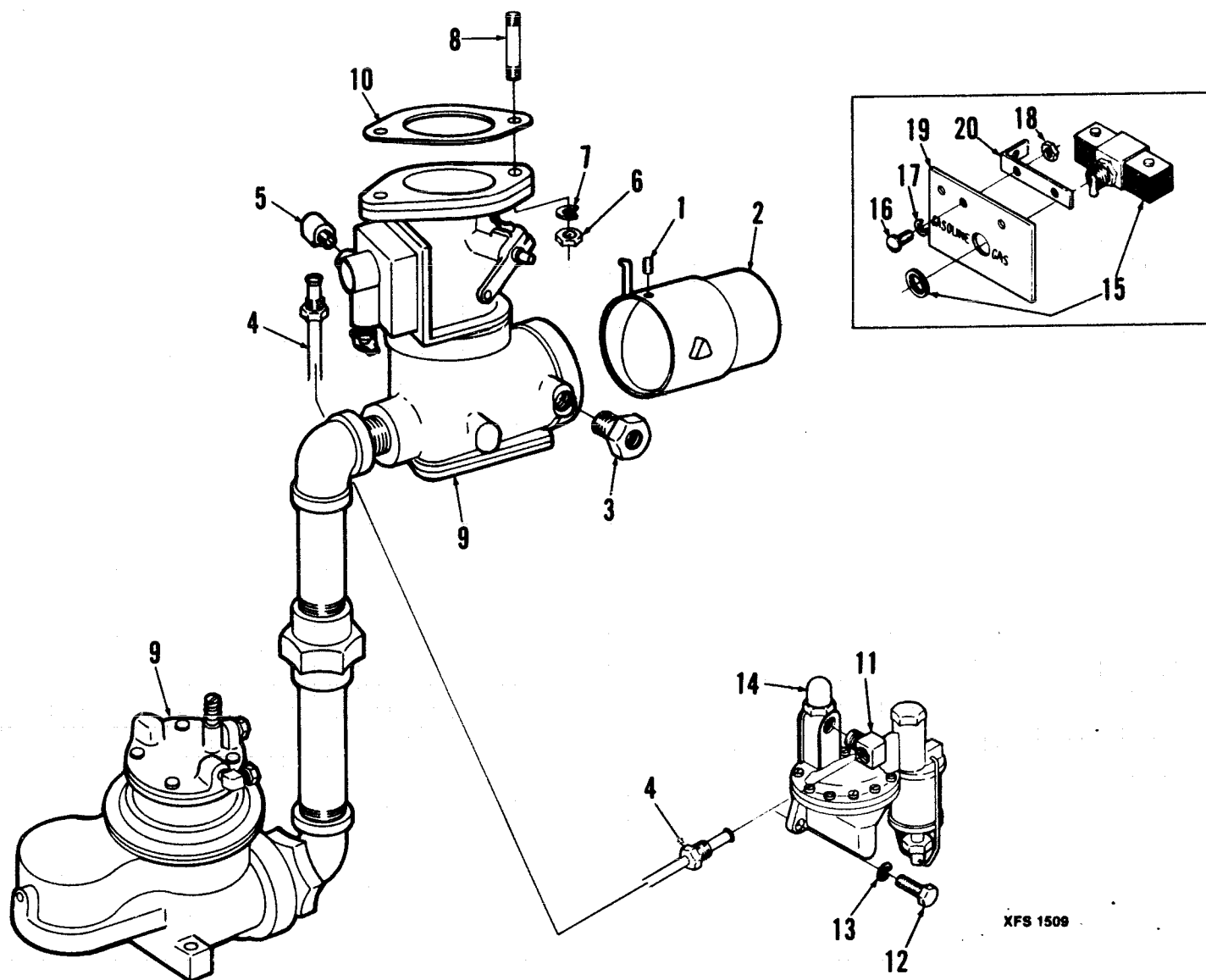


ES1115

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	KIT, FILTER - VOLTAGE REGULATOR (Includes Parts Marked *)			7	850-0040	2	Washer, Lock - Spring (1/4")
	232-2694	1	Used on Sets with End Bell Mounted Voltage Regulator	8	304-0427	4	Washer, Centering (1/4")
	232-2695	1	Used on Sets with Voltage Regulator Mounted in Control Box	9	304-0292	2	Insulator
1	332-0941	5	*Tie, Cable	10	354-0025	2	Resistor, Fixed, Wire Wound (10-Ohm, 100 Watt)
2	800-0003	2	*Screw, Cap - Hex Head (1/4-20 x 1/2")	11	813-0098	4	Screw, Machine - Round Head (#10-32 x 3/8")
3	850-0040	2	*Washer, Lock - Spring (1/4")	12	870-0053	4	Nut, Hex (#10-32)
4	*FILTER ASSEMBLY (Includes all Parts Except as Indicated)			13	850-0030	4	Washer, Lock - Spring (#10)
	232-2219	REF	Part of Kit 232-2694	14	312-0189	2	Bracket, Mounting - Capacitor
	232-2692	REF	Part of Kit 232-2695	15	312-0188	1	Capacitor, Fixed - 15 MFD, 440 VAC
5	812-0165	2	Screw, Machine - Round Head (1/4-20 x 4-1/2")	16	232-2210	1	Bracket, Mounting
6	862-0001	2	Nut, Hex (1/4-20)	17	232-2693	3	Spacer (Part of 232-2692 Only)
				18	TERMINALS (Select as Required)		
					332-1279	8	Insulated 14-16 AWG
					332-0529	4	Lug 14-16 AWG

\* Parts included in kits

**OPTIONAL  
DUAL FUEL SYSTEM  
(GASOLINE & NAT. GAS)  
SPEC F ONLY**



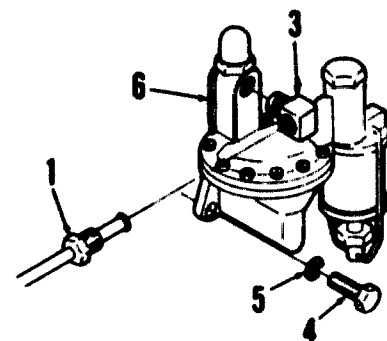
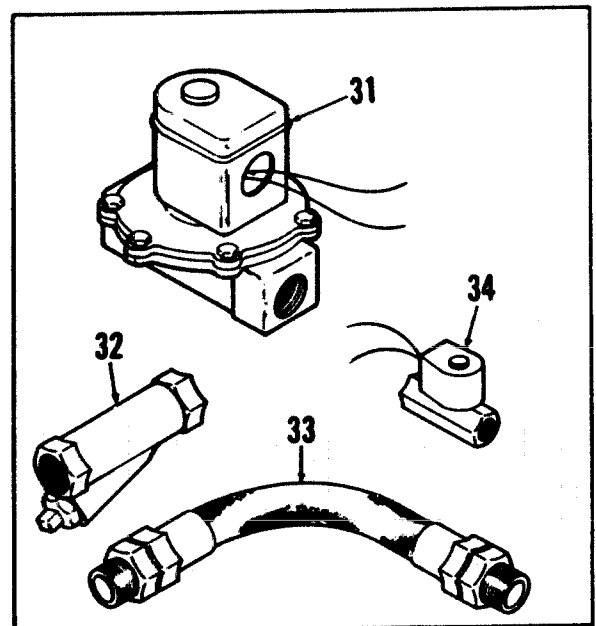
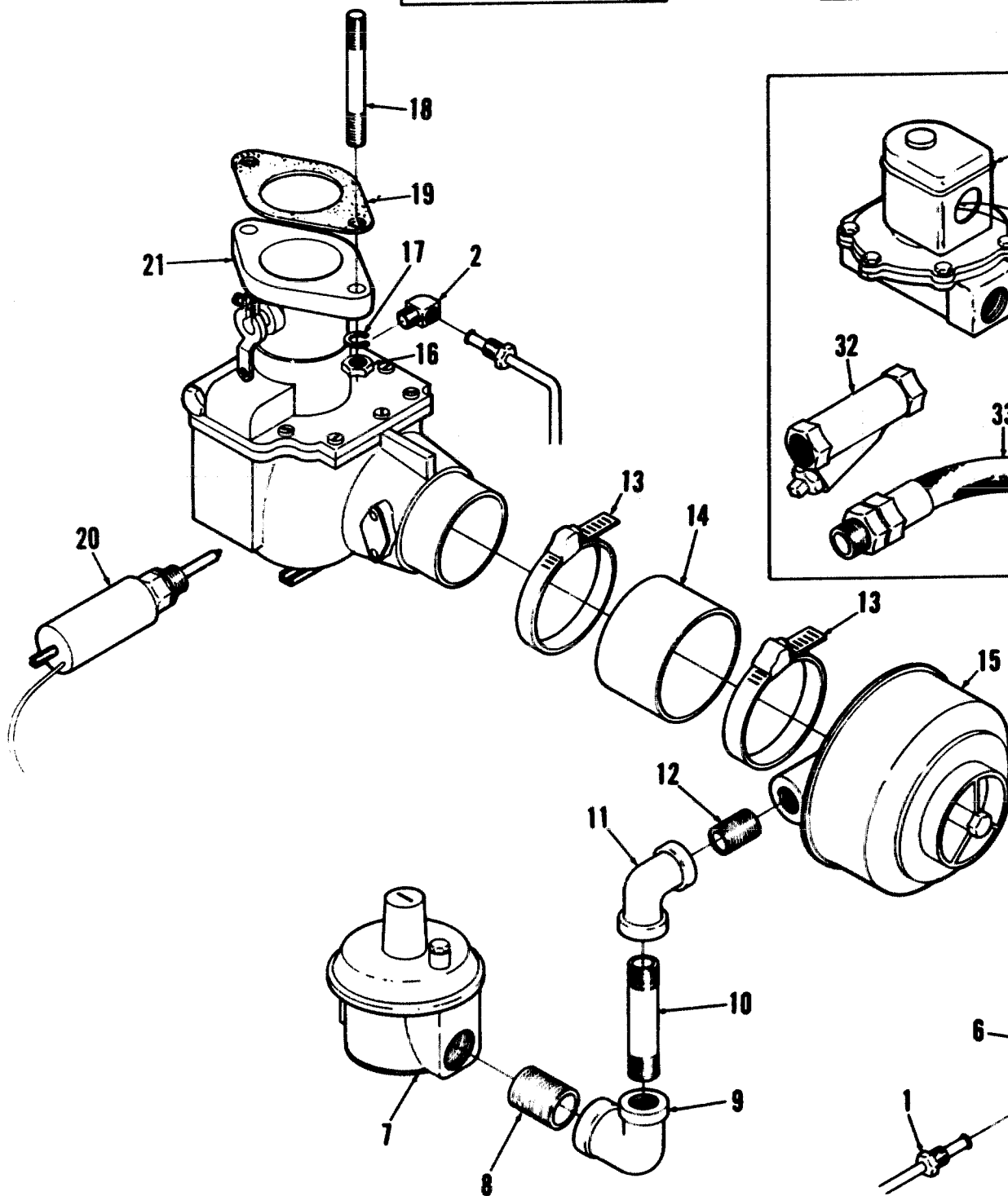
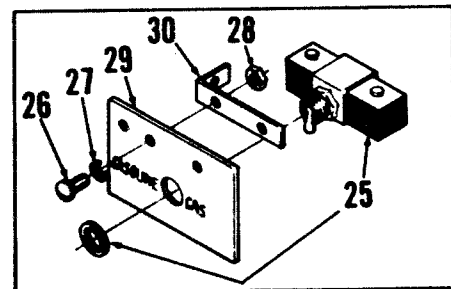
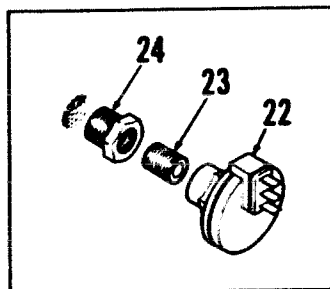
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	803-0002	4	Setscrew (#8-32-3/8")
2	CHOKE ASSEMBLY		(See Anti-Dieseling System for components)
3	148-0107	1	Vent
4	#	1	Line, Fuel
5	502-0039	1	Elbow, Pipe - Inverted Male, 90 Deg (1/4"NPT x 3/8" Tube)
6	110-0067	2	Nut, Hex (7/16-20)
7	850-0055	2	Washer, Lock - Spring (7/16")
8	#	2	Stud
9	#	1	Carburetor, Gas/Gaso and Regulator Assembly
10	#	1	Gasket

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
11	502-0043	1	Elbow, Pipe - Inverted Male, 90 Deg (3/8"NPT x 3/8" Tube)
12	800-0028	2	Screw, Cap - Hex Head (5/16-18 x 1")
13	850-0045	2	Washer, Lock - Spring (5/16")
14	#	1	Pump, Fuel
15	308-0005	1	Switch, Toggle
16	813-0100	2	Screw, Machine - Round Head (#10-32 x 1/2")
17	850-0030	2	Washer, Lock - Spring (#10)
18	871-0010	2	Nut, Hex (#10-32)
19	308-0150	1	Plate, Mounting - Switch
20	306-0155	1	Bracket, Mounting

# - For replacement refer to Engine Manufacturer



**OPTIONAL  
DUAL FUEL SYSTEM  
(GASOLINE & NAT. GAS)  
BEGIN SPEC G**



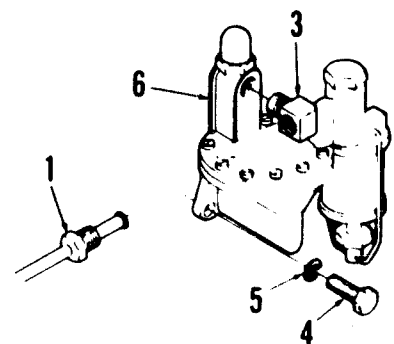
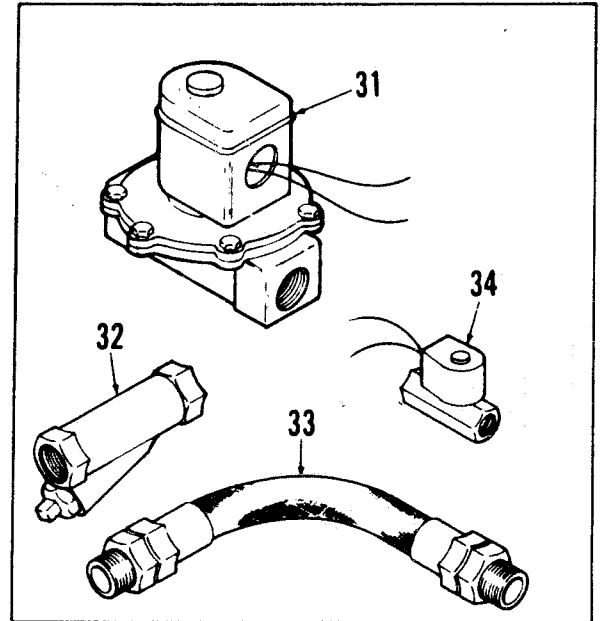
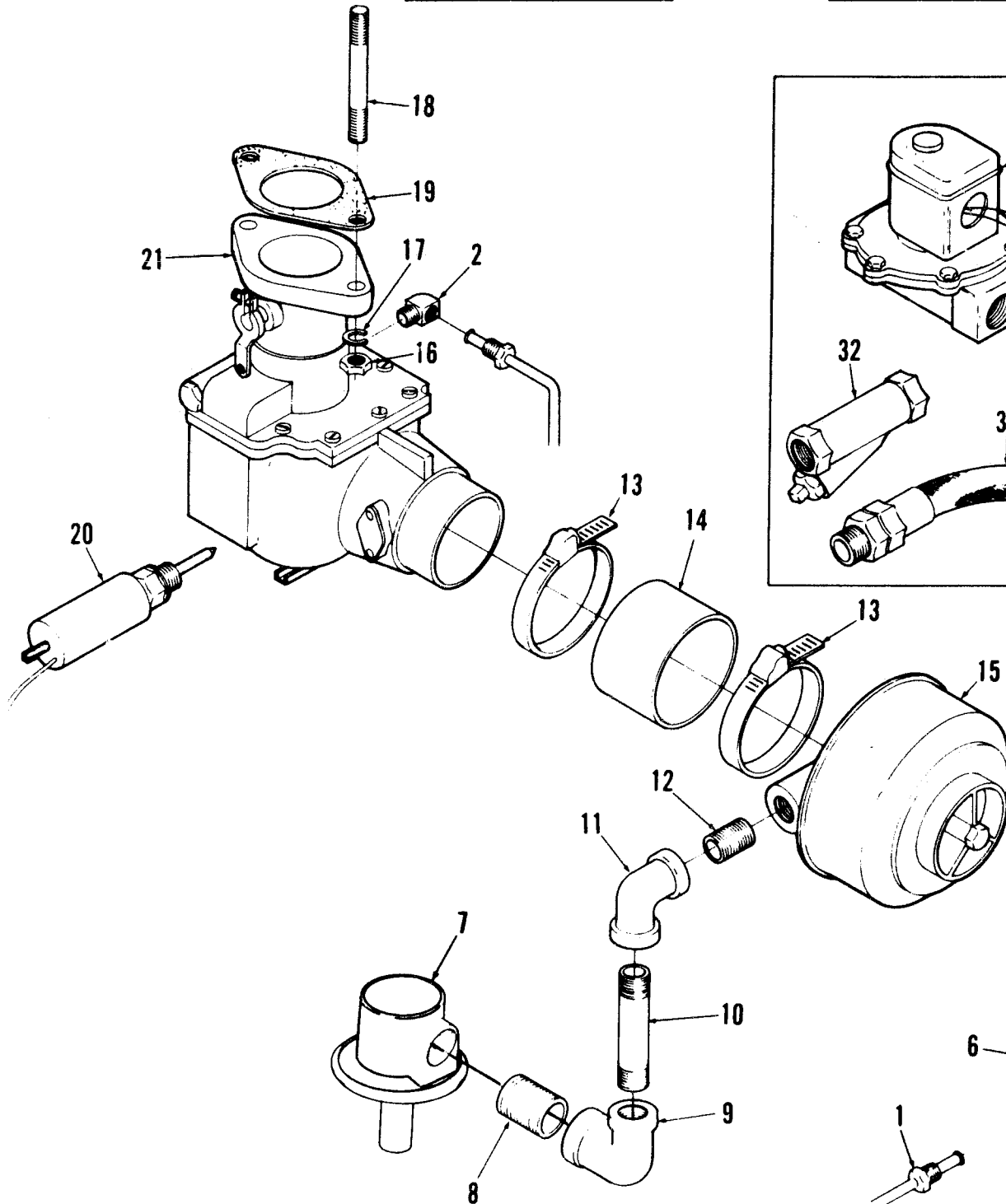
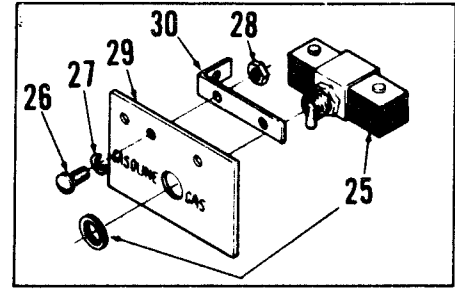
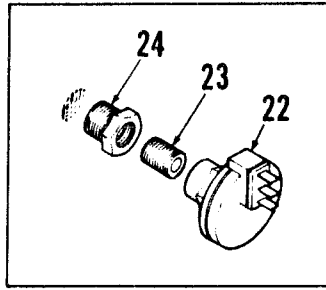
XFS 1503

**OPTIONAL  
DUAL FUEL SYSTEM  
(GASOLINE & NAT. GAS)  
BEGIN SPEC G**

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
TYPICAL DUAL FUEL SYSTEM (Gasoline & Nat. Gas)			
1	#	1	Line, Fuel
2	502-0039	1	Elbow, Pipe - Inverted Male, 90 Deg (1/4"NPT x 3/8" Tube)
3	504-0043	1	Elbow, Pipe - Inverted Male, 90 Deg (3/8"NPT x 3/8" Tube)
4	800-0028	2	Screw, Cap - Hex Head (5/16-18 x 1")
5	850-0045	2	Washer, Lock - Spring (5/16")
6	#	1	Pump, Fuel
7	148-0596	1	Regulator, Pressure - Nat Gas (1-1/4"NPT)
8	505-0177	1	Nipple, Pipe - Close (1-1/4"NPT x 1-1/2"Lg)
9	505-0751	1	Elbow, Pipe - Reducing, 90 Deg (1-1/4"NPT x 3/4"NPT)
10	505-0165	1	Nipple, Pipe (3/4"NPT x 5-1/2"Lg)
11	505-0132	1	Elbow, Pipe - 90 Deg (3/4"NPT)
12	505-0102	1	Nipple, Pipe - Close (3/4"NPT x 1-3/8"Lg)
13	503-0621	2	Clamp, Hose
14	503-0659	1	Hose, Rubber (3"ID x 2"Lg)
15	148-0723	1	Mixer, Gas
16	110-0067	2	Nut, Hex (7/16-20)
17	850-0055	2	Washer, Lock - Spring (7/16")
18	#	2	Stud
19	#	1	Gasket
20	307-1458	1	Solenoid, Fuel Cutoff (12 VDC)
21	#	1	Carburetor, Gasoline
22	148-0367	1	Switch, Control - Vacuum (12 VDC)
23	502-0098	1	Nipple, Pipe - Close (1/8"NPT x 3/4"Lg)
24	505-0016	1	Bushing, Reducer - Hex (3/8"NPT x 1/8"NPT)
25	308-0005	1	Switch, Toggle
26	813-0100	2	Screw, Machine - Round Head (#10-32 x 1/2")
27	850-0030	2	Washer, Lock - Spring (#10)
28	871-0010	2	Nut, Hex (#10-32)
29	308-0150	1	Plate, Mounting - Switch
30	306-0155	1	Bracket, Mounting
31	VALVE, SOLENOID - GASEOUS FUEL (Medium Pressure)		
	307-0836	1	1"NPT, 12 VDC, 25 PSI
	307-0865	1	1"NPT, 24 VDC, 25 PSI
	307-0837	1	1-1/4"NPT, 12 VDC, 25 PSI
	307-0866	1	1-1/4"NPT, 24 VDC, 25 PSI
	307-0840	1	2"NPT, 12 VDC, 15 PSI
	307-0841	1	2"NPT, 12 VDC, 15 PSI
32	STRAINER - GASEOUS FUEL (Select as applicable)		
	149-0752	1	1"NPT
	149-0624	1	1-1/4"NPT
	149-0751	1	2"NPT
	149-1241	1	3"NPT
33	LINE, FUEL - WATER, GAS/GASO (Select as applicable) (NOTE: Not for use with LPG Liquid)		
	503-0273	1	1"NPT x 12"Lg
	503-0430	1	1-1/4"NPT x 13"Lg
	503-0331	1	1-1/2"NPT x 14"Lg
	503-0372	1	2"NPT x 18"Lg
	503-0577	1	2-1/2"NPT x 18"Lg
	503-0703	1	3"NPT x 24"Lg
34	307-0268	1	Valve, Solenoid - Liquid Fuel (1/4"NPT, 12 VDC, 300 PSI)

# - For replacement refer to Engine Manufacturer.

# **OPTIONAL DUAL FUEL SYSTEM (GASOLINE & LPG VAPOR)**

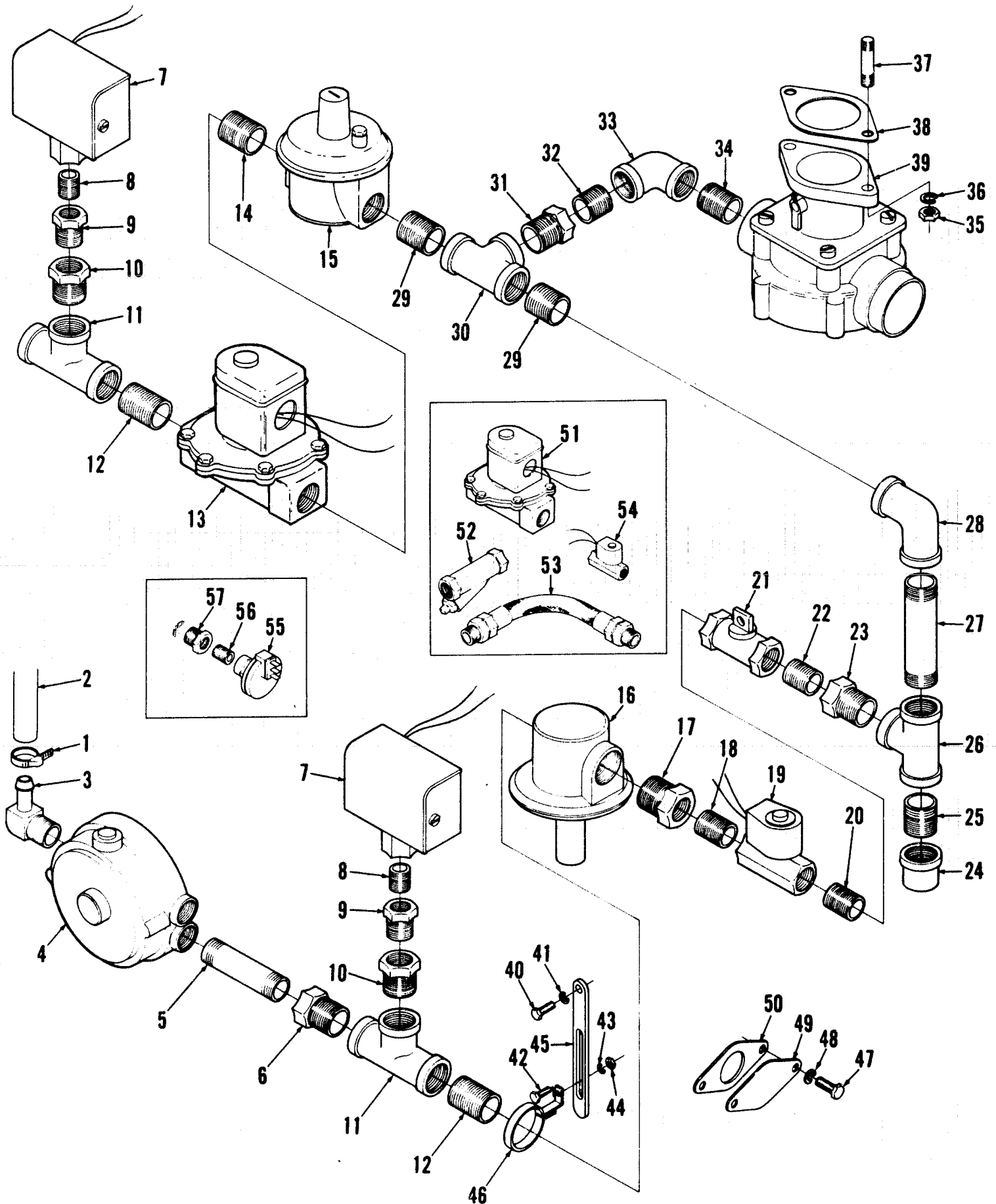


# OPTIONAL DUAL FUEL SYSTEM (GASOLINE & LPG VAPOR)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
TYPICAL DUAL FUEL SYSTEM (Gasoline & LPG Vapor)			
1	#	1	Line, Fuel
2	502-0039	1	Elbow, Pipe - Inverted Male, 90 Deg (1/4"NPT x 3/8" Tube)
3	504-0043	1	Elbow, Pipe - Inverted Male, 90 Deg (3/8"NPT x 3/8" Tube)
4	800-0028	2	Screw, Cap - Hex Head (5/16-18 x 1")
5	850-0045	2	Washer, Lock - Spring (5/16")
6	#	1	Pump, Fuel
7	148-0635	1	Regulator, Pressure - LPG Vapor (1-1/4"NPT)
8	505-0177	1	Nipple, Pipe - Close (1-1/4"NPT x 1-1/2"Lg)
9	505-0751	1	Elbow, Pipe - Reducing, 90 Deg (1-1/4"NPT x 3/4"NPT)
10	505-0165	1	Nipple, Pipe (3/4"NPT x 5-1/2"Lg)
11	505-0132	1	Elbow, Pipe - 90 Deg (3/4"NPT)
12	505-0102	1	Nipple, Pipe - Close (3/4"NPT x 1-3/8"Lg)
13	503-0621	2	Clamp, Hose
14	503-0659	1	Hose, Rubber (3"ID x 2"Lg)
15	148-0723	1	Mixer, Gas
16	110-0067	2	Nut, Hex (7/16-20)
17	850-0055	2	Washer, Lock - Spring (7/16")
18	#	2	Stud
19	#	1	Gasket
20	307-1458	1	Solenoid, Fuel Cutoff (12 VDC)
21	#	1	Carburetor, Gasoline
22	148-0367	1	Switch, Control - Vacuum (12 VDC)
23	502-0098	1	Nipple, Pipe - Close (1/8"NPT x 3/4"Lg)
24	505-0016	1	Bushing, Reducer - Hex (3/8"NPT x 1/8"NPT)
25	308-0005	1	Switch, Toggle
26	813-0100	2	Screw, Machine - Round Head (#10-32 x 1/2")
27	850-0030	2	Washer, Lock - Spring (#10)
28	871-0010	2	Nut, Hex (#10-32)
29	308-0150	1	Plate, Mounting - Switch
30	306-0155	1	Bracket, Mounting
31	VALVE, SOLENOID - GASEOUS FUEL (Medium Pressure)		
	307-0836	1	1"NPT, 12 VDC, 25 PSI
	307-0865	1	1"NPT, 24 VDC, 25 PSI
	307-0837	1	1-1/4"NPT, 12 VDC, 25 PSI
	307-0866	1	1-1/4"NPT, 24 VDC, 25 PSI
	307-0840	1	2"NPT, 12 VDC, 15 PSI
	307-0841	1	2"NPT, 12 VDC, 15 PSI
32	STRAINER - GASEOUS FUEL (Select as applicable)		
	149-0752	1	1"NPT
	149-0624	1	1-1/4"NPT
	149-0751	1	2"NPT
	149-1241	1	3"NPT
33	LINE, FUEL - WATER, GAS/GASO (Select as applicable) (NOTE: Not for use with LPG Liquid)		
	503-0273	1	1"NPT x 12"Lg
	503-0430	1	1-1/4"NPT x 13"Lg
	503-0331	1	1-1/2"NPT x 14"Lg
	503-0372	1	2"NPT x 18"Lg
	503-0577	1	2-1/2"NPT x 18"Lg
	503-0703	1	3"NPT x 24"Lg
34	307-0268	1	Valve, Solenoid - Liquid Fuel (1/4"NPT, 12 VDC, 300 PSI)

# - For replacement refer to Engine Manufacturer.

# **OPTIONAL DUAL FUEL SYSTEM (NAT. GAS & LPG LIQUID)**



XFS 1511

**D10**

# **OPTIONAL DUAL FUEL SYSTEM (NAT. GAS & LPG LIQUID)**

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
TYPICAL DUAL FUEL SYSTEM (Nat. Gas & LPG Liquid)			
	£		Automatic Fuel Control System
			Manual Fuel Control System
1	503-0183	4	Clamp, Hose
2	503-1169	2	Hose, Rubber (5/8"ID x 48"Lg)
3	502-0787	2	Adapter, Hose to Pipe, 90 Deg (3/8"NPT x 5/8"Hose)
4	148-0625	1	Converter/Regulator - LPG Gas - 1-1/2 PSI Output (1/4"NPT x 1"NPT)
5	NIPPLE, PIPE (Select as applicable)		
	505-0086	1	1"NPT x 2-1/2"Lg
	505-0087	1	1"NPT x 3"Lg
	505-0088	1	1"NPT x 4-1/2"Lg
	505-0089	1	1"NPT x 5"Lg
	505-0090	1	1"NPT x 6"Lg
6	505-0023	1	Bushing, Reducer - Hex (1-1/4"NPT x 1"NPT)
7	148-0627	2	£Switch, Pressure (115/230 AC/DC) (1/4"NPT)
8	505-0099	2	£Nipple, Pipe - Close (1/4"NPT x 7/8"Lg)
9	505-0017	2	£Bushing, Reducer - Hex (3/8"NPT x 1/4"NPT)
10	505-0128	2	£Bushing, Reducer - Hex (1-1/4"NPT x 3/8"NPT)
11	505-0249	2	£Tee, Pipe (1-1/4"NPT)
12	505-0177	2	£Nipple, Pipe - Close (1-1/4"NPT x 1-5/8"Lg)
13	307-0837	1	Valve, Solenoid (1-1/4"NPT, 12 VDC, 25 PSI)
14	505-0177	1	Nipple, Pipe - Close (1-1/4"NPT x 1-5/8"Lg)
15	148-0596	1	Regulator, Pressure - Nat Gas (1-1/4"NPT)
16	148-0635	1	Regulator, Pressure - LPG Vapor (1-1/4"NPT)
17	505-0023	1	Bushing, Reducer - Hex (1-1/4"NPT x 1"NPT)
18	505-0004	1	Nipple, Pipe - Close (1"NPT x 1-1/2"Lg)
19	307-1041	1	Valve, Solenoid - Gaseous Fuel, Low Pressure (1"NPT, 12 VDC, 1/2 PSI)
20	505-0004	1	Nipple, Pipe - Close (1"NPT x 1-1/2"Lg)
21	148-0626	1	Valve, Control - Manual (1"NPT)
22	505-0004	1	Nipple, Pipe - Close (1"NPT x 1-1/2"Lg)
23	505-0023	1	Bushing, Reducer - Hex (1-1/4"NPT x 1"NPT)
24	505-0329	1	Cap, Pipe (1-1/4"NPT)
25	505-0177	1	Nipple, Pipe - Close (1-1/4"NPT x 1-5/8"Lg)
26	505-0249	1	Tee, Pipe (1-1/4"NPT)
27	505-0311	1	Nipple, Pipe (1-1/4"NPT x 8-1/2"Lg)
28	505-0042	1	Elbow, Pipe - 90 Deg (1-1/4"NPT)
29	505-0177	2	Nipple, Pipe - Close (1-1/4"NPT x 1-5/8"Lg)
30	505-0249	1	Tee, Pipe (1-1/4"NPT)

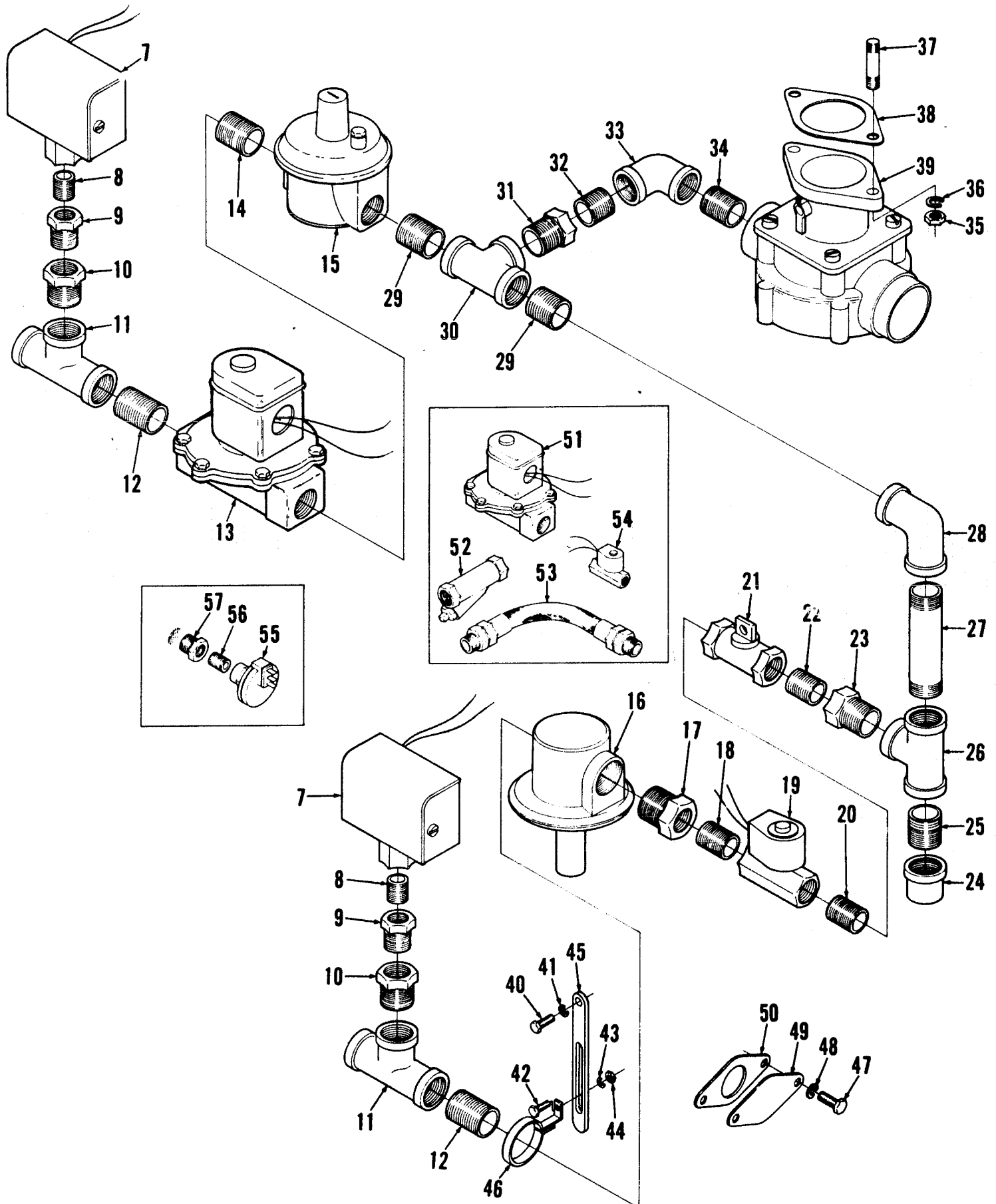
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
31	505-0023	1	Bushing, Reducer - Hex (1-1/4"NPT x 1"NPT)
32	505-0004	1	Nipple, Pipe - Close (1"NPT x 1-1/2"Lg)
33	505-0356	1	Elbow, Pipe - Reducing, 90 Deg (1"NPT x 3/4"NPT)
34	505-0102	1	Nipple, Pipe - Close (3/4"NPT x 1-3/8"Lg)
35	110-0067	2	Nut, Hex (7/16-20)
36	850-0055	2	Washer, Lock - Spring (7/16")
37	#	2	Stud
38	#	1	Gasket
39	#	1	Carburetor, Gas Vapor
40	800-0048	1	Screw, Cap - Hex Head (3/8-16 x 3/4")
41	850-0048	1	Washer, Lock - Spring (3/8")
42	800-0004	2	Screw, Cap - Hex Head (1/4-20 x 5/8")
43	850-0038	2	Washer, Lock - Spring (1/4")
44	862-0001	2	Nut, Hex (1/4-20)
45	191-0905	1	Bracket, Adjusting - Alternator
46	130-0882	1	Clamp, Pipe
47	800-0028	2	Screw, Cap - Hex Head (5/16-18 x 1")
48	850-0045	2	Washer, Lock - Spring (5/16")
49	#	1	Cover Plate
50	#	1	Gasket
51	VALVE, SOLENOID - GASEOUS FUEL (Medium Pressure)		
	307-0836	1	1"NPT, 12 VDC, 25 PSI
	307-0865	1	1"NPT, 24 VDC, 25 PSI
	307-0837	1	1-1/4"NPT, 12 VDC, 25 PSI
	307-0866	1	1-1/4"NPT, 24 VDC, 25 PSI
	307-0840	1	2"NPT, 12 VDC, 15 PSI
	307-0841	1	2"NPT, 24 VDC, 15 PSI
52	STRAINER - GASEOUS FUEL (Select as applicable)		
	149-0752	1	1"NPT
	149-0624	1	1-1/4"NPT
	149-0751	1	2"NPT
	149-1241	1	3"NPT
53	LINE, FUEL - WATER, GAS/GASO (Select as applicable)		
	(NOTE: Not for use with LPG Liquid)		
	503-0273	1	1"NPT x 12"Lg
	503-0430	1	1-1/4"NPT x 13"Lg
	503-0331	1	1-1/2"NPT x 14"Lg
	503-0372	1	2"NPT x 18"Lg
	503-0577	1	2-1/2"NPT x 18"Lg
	503-0703	1	3"NPT x 24"Lg
54	307-0268	1	Valve, Solenoid - Liquid Fuel (1/4"NPT, 12 VDC, 300 PSI)
55	148-0367	1	Switch, Control - Vacuum (12 VDC)
56	502-0098	1	Nipple, Pipe - Close (1/8"NPT x 3/4"Lg)
57	505-0016	1	Bushing, Reducer - Hex (3/8"NPT x 1/8"NPT)

# - For replacement refer to Engine Manufacturer.

£ - Items required for Auto Control Systems

NOTE: Plumbing configurations may vary for each installation for Auto or Manual Control Systems, depending on supply routes for the Nat Gas or LPG.

# **OPTIONAL DUAL FUEL SYSTEM (NAT. GAS & LPG VAPOR)**



# OPTIONAL DUAL FUEL SYSTEM (NAT. GAS & LPG VAPOR)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
TYPICAL DUAL FUEL SYSTEM (Nat. Gas & LPG Vapor)							
	£		Automatic Fuel Control System				
			Manual Fuel Control System				
7	148-0627	2	£Switch, Pressure (115/230 AC/DC) (1/4"NPT)	31	505-0023	1	Bushing, Reducer - Hex (1-1/4"NPT x 1"NPT)
8	505-0099	2	£Nipple, Pipe - Close (1/4"NPT x 7/8"Lg)	32	505-0004	1	Nipple, Pipe - Close (1"NPT x 1-1/2"Lg)
9	505-0017	2	£Bushing, Reducer - Hex (3/8"NPT x 1/4"NPT)	33	505-0356	1	Elbow, Pipe - Reducing, 90 Deg (1"NPT x 3/4"NPT)
10	505-0128	2	£Bushing, Reducer - Hex (1-1/4"NPT x 3/8"NPT)	34	505-0102	1	Nipple, Pipe - Close (3/4"NPT x 1-3/8"Lg)
11	505-0249	2	£Tee, Pipe (1-1/4"NPT)	35	110-0067	2	Nut, Hex (7/16-20)
12	505-0177	2	£Nipple, Pipe - Close (1-1/4"NPT x 1-5/8"Lg)	36	850-0055	2	Washer, Lock - Spring (7/16")
13	307-0837	1	Valve, Solenoid (1-1/4"NPT, 12 VDC, 25 PSI)	37	#	2	Stud
14	505-0177	1	Nipple, Pipe - Close (1-1/4"NPT x 1-5/8"Lg)	38	#	1	Gasket
15	148-0596	1	Regulator, Pressure - Nat Gas (1-1/4"NPT)	39	#	1	Carburetor, Gas Vapor
16	148-0635	1	Regulator, Pressure - LPG Vapor (1-1/4"NPT)	40	800-0048	1	Screw, Cap - Hex Head (3/8-16 x 3/4")
17	505-0023	1	Bushing, Reducer - Hex (1-1/4"NPT x 1"NPT)	41	850-0048	1	Washer, Lock - Spring (3/8")
18	505-0004	1	Nipple, Pipe - Close (1"NPT x 1-1/2"Lg)	42	800-0004	2	Screw, Cap - Hex Head (1/4-20 x 5/8")
19	307-1041	1	Valve, Solenoid - Gaseous Fuel, Low Pressure (1"NPT, 12 VDC, 1/2 PSI)	43	850-0038	2	Washer, Lock - Spring (1/4")
20	505-0004	1	Nipple, Pipe - Close (1"NPT x 1-1/2"Lg)	44	862-0001	2	Nut, Hex (1/4-20)
21	148-0626	1	Valve, Control - Manual (1"NPT)	45	191-0905	1	Bracket, Adjusting - Alternator
22	505-0004	1	Nipple, Pipe - Close (1"NPT x 1-1/2"Lg)	46	130-0882	1	Clamp, Pipe
23	505-0023	1	Bushing, Reducer - Hex (1-1/4"NPT x 1"NPT)	47	800-0028	2	Screw, Cap - Hex Head (5/16-18 x 1")
24	505-0329	1	Cap, Pipe (1-1/4"NPT)	48	850-0045	2	Washer, Lock - Spring (5/16")
25	505-0177	1	Nipple, Pipe - Close (1-1/4"NPT x 1-5/8"Lg)	49	#	1	Cover Plate
26	505-0249	1	Tee, Pipe (1-1/4"NPT)	50	#	1	Gasket
27	505-0311	1	Nipple, Pipe (1-1/4"NPT x 8-1/2"Lg)	51	VALVE, SOLENOID - GASEOUS FUEL (Medium Pressure)		
28	505-0042	1	Elbow, Pipe - 90 Deg (1-1/4"NPT)	307-0836	1	1"NPT, 12 VDC, 25 PSI	
29	505-0177	2	Nipple, Pipe - Close (1-1/4"NPT x 1-5/8"Lg)	307-0865	1	1"NPT, 24 VDC, 25 PSI	
30	505-0249	1	Tee, Pipe (1-1/4"NPT)	307-0837	1	1-1/4"NPT, 12 VDC, 25 PSI	
				307-0866	1	1-1/4"NPT, 24 VDC, 25 PSI	
				307-0840	1	2"NPT, 12 VDC, 15 PSI	
				307-0841	1	2"NPT, 24 VDC, 15 PSI	
				52	STRAINER - GASEOUS FUEL (Select as applicable)		
				149-0752	1	1"NPT	
				149-0624	1	1-1/4"NPT	
				149-0751	1	2"NPT	
				149-1241	1	3"NPT	
				53	LINE, FUEL - WATER, GAS/GASO (Select as applicable)		
					(NOTE: Not for use with LPG Liquid)		
				503-0273	1	1"NPT x 12"Lg	
				503-0430	1	1-1/4"NPT x 13"Lg	
				503-0331	1	1-1/2"NPT x 14"Lg	
				503-0372	1	2"NPT x 18"Lg	
				503-0577	1	2-1/2"NPT x 18"Lg	
				503-0703	1	3"NPT x 24"Lg	
				54	307-0268	1	Valve, Solenoid - Liquid Fuel (1/4"NPT, 12 VDC, 300 PSI)
				55	148-0367	1	Switch, Control - Vacuum (12 VDC)
				56	502-0098	1	Nipple, Pipe - Close (1/8"NPT x 3/4"Lg)
				57	505-0016	1	Bushing, Reducer - Hex (3/8"NPT x 1/8"NPT)

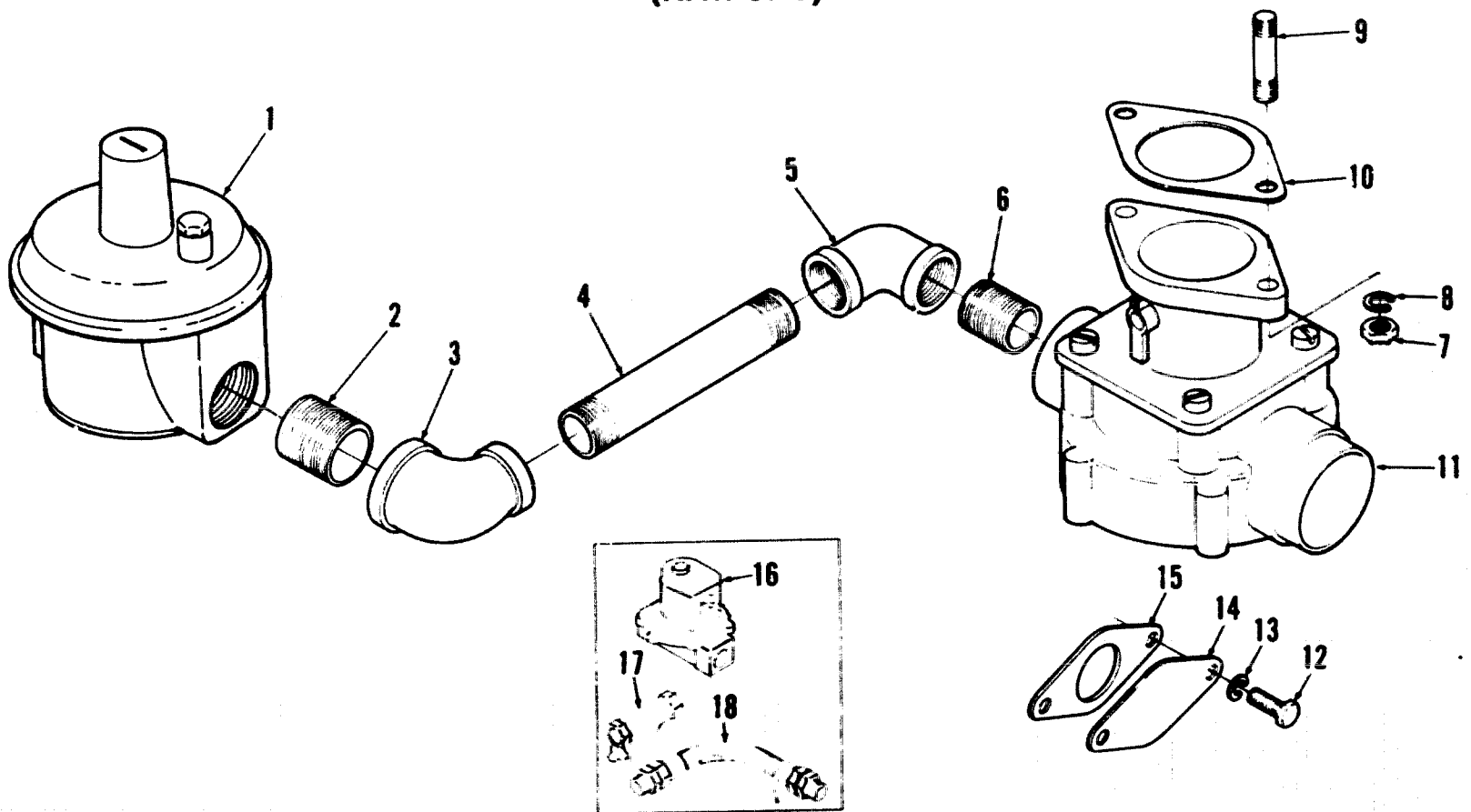
# - For replacement refer to Engine Manufacturer.

£ - Items required for Auto Control Systems

NOTE: Plumbing configurations may vary for each installation for Auto or Manual Control Systems, depending on supply routes for the Nat Gas or LPG.



# **OPTIONAL FUEL SYSTEM (NAT. GAS)**



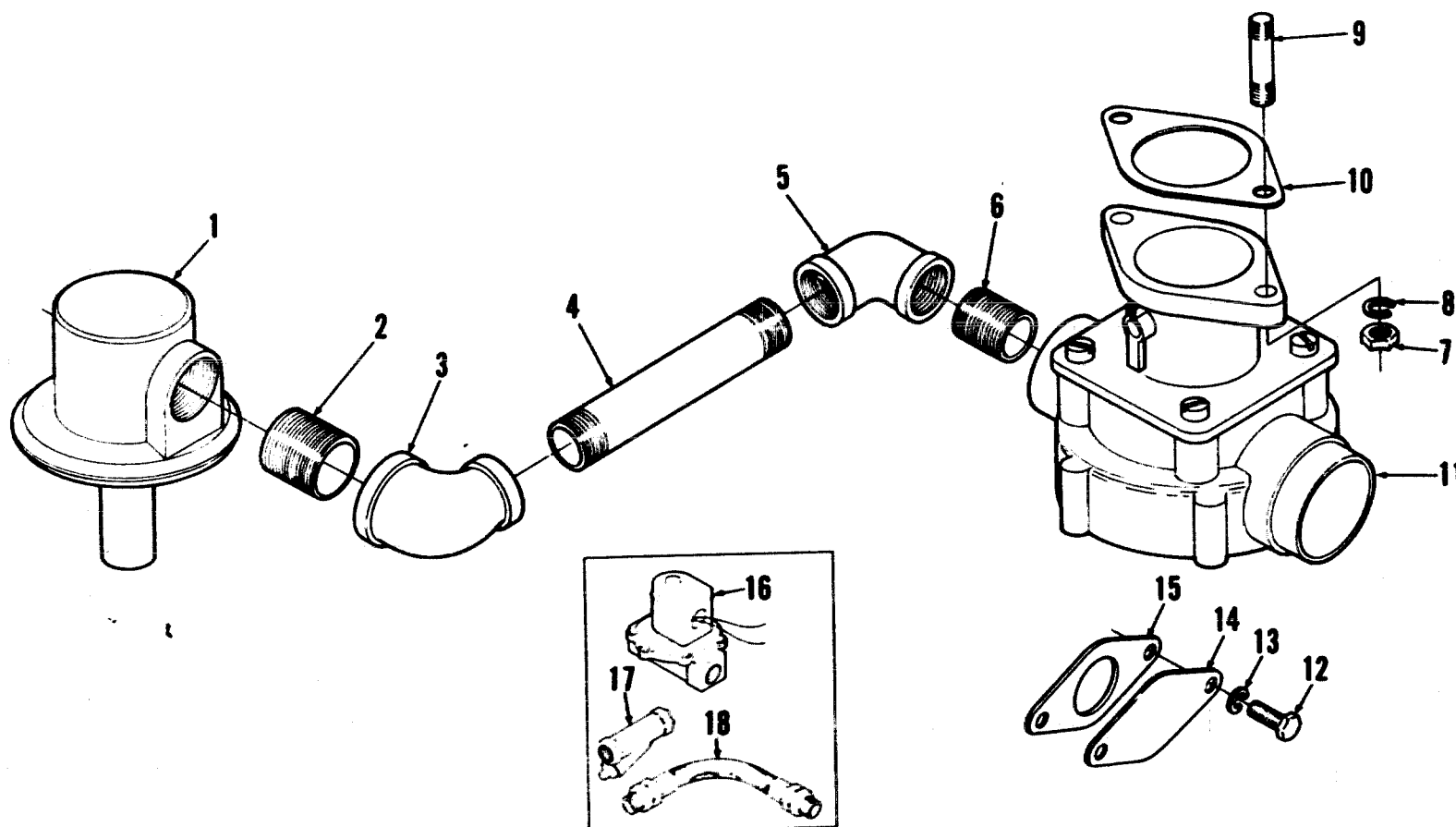
FB 1508

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
TYPICAL DUAL FUEL SYSTEM (Natural Gas)			
1	148-0596	1	Regulator, Pressure - Nat Gas (1-1/4"NPT)
2	505-0177	1	Nipple, Pipe - Close (1-1/4"NPT x 1-1/2"Lg)
3	505-0751	1	Elbow, Pipe - Reducing, 90 Deg (1-1/4"NPT x 3/4"NPT)
4	505-0165	1	Nipple, Pipe (3/4"NPT x 5-1/2"Lg)
5	505-0132	1	Elbow, Pipe - 90 Deg (3/4"NPT)
6	505-0102	1	Nipple, Pipe - Close (3/4"NPT x 1-3/8"Lg)
7	110-0067	2	Nut, Hex (7/16-20)
8	850-0055	2	Washer, Lock - Spring (7/16")
9	#	2	Stud
10	#	1	Gasket
11	#	1	Carburetor, Gas Vapor
12	800-0028	2	Screw, Cap - Hex Head (5/16-18 x 1")
13	850-0045	2	Washer, Lock - Spring (5/16")
14	#	1	Cover Plate
15	#	1	Gasket

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
16	VALVE, SOLENOID - GASEOUS FUEL (Medium Pressure)		
	307-0836	1	1"NPT, 12 VDC, 25 PSI
	307-0865	1	1"NPT, 24 VDC, 25 PSI
	307-0837	1	1-1/4"NPT, 12 VDC, 25 PSI
	307-0866	1	1-1/4"NPT, 24 VDC, 25 PSI
	307-0840	1	2"NPT, 12 VDC, 15 PSI
	307-0841	1	2"NPT, 24 VDC, 15 PSI
17	STRAINER - GASEOUS FUEL (Select as applicable)		
	149-0752	1	1"NPT
	149-0824	1	1-1/4"NPT
	149-0751	1	2"NPT
	149-1241	1	3"NPT
18	LINE, FUEL - WATER, GAS/GASO (Select as applicable)		
	(NOTE: Not for use with LPG Liquid)		
	503-0273	1	1"NPT x 12"Lg
	503-0430	1	1-1/4"NPT x 13"Lg
	503-0331	1	1-1/2"NPT x 14"Lg
	503-0372	1	2"NPT x 18"Lg
	503-0577	1	2-1/2"NPT x 18"Lg
	503-0703	1	3"NPT x 24"Lg
	503-0704	1	3-1/2"NPT x 24"Lg

# - For replacement refer to Engine Manufacturer

# **OPTIONAL FUEL SYSTEM (LPG VAPOR)**



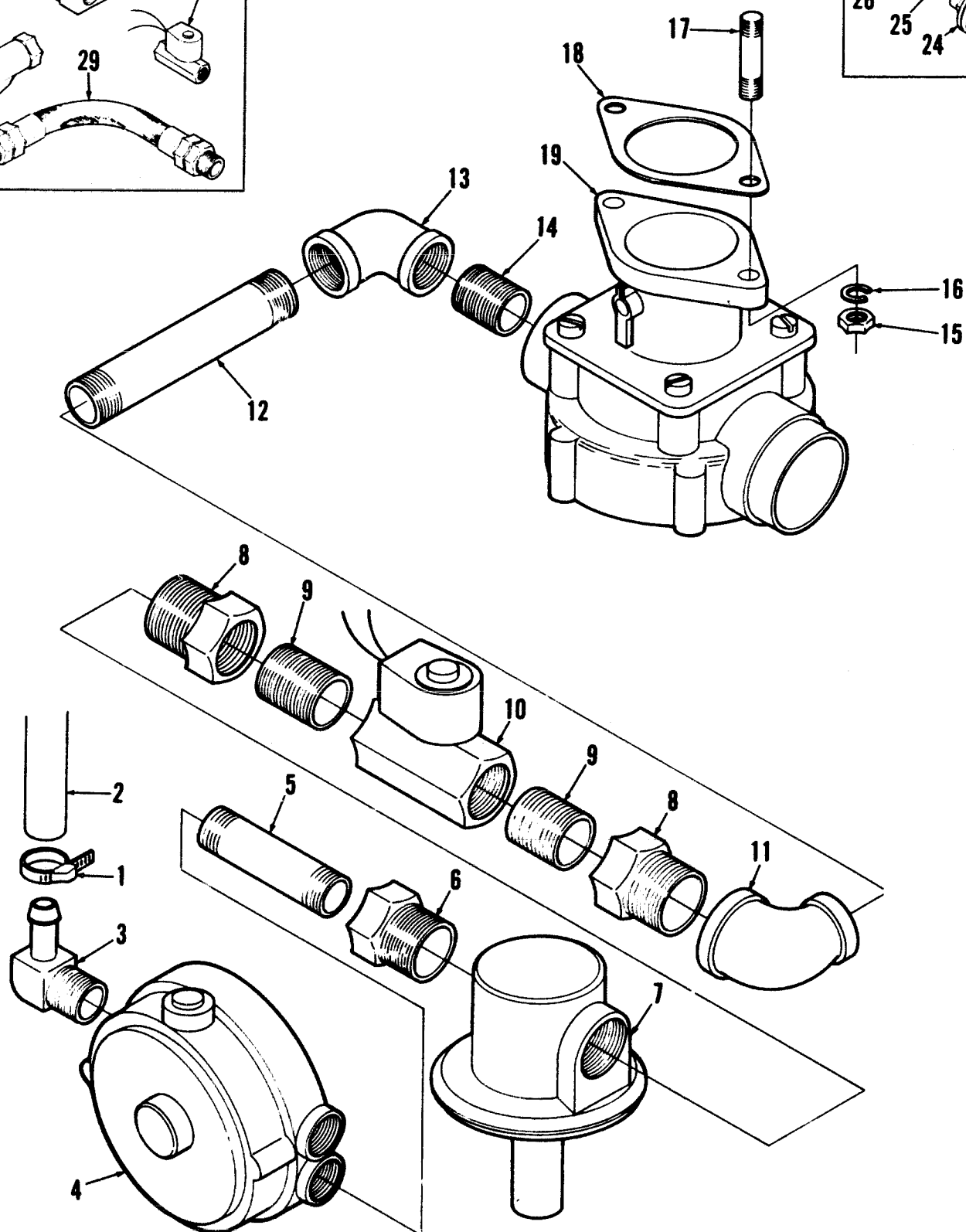
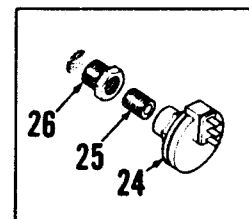
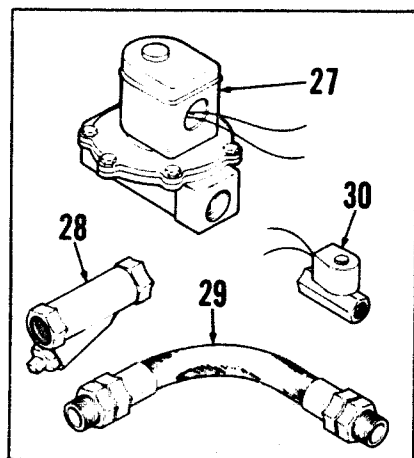
XFB 1507

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
<b>TYPICAL FUEL SYSTEM (LPG Vapor)</b>			
1	148-0635	1	Regulator, Pressure - LPG Vapor (1-1/4"NPT)
2	505-0177	1	Nipple, Pipe - Close (1-1/4"NPT x 1-1/2"Lg)
3	505-0751	1	Elbow, Pipe - Reducing, 90 Deg (1-1/4"NPT x 3/4"NPT)
4	505-0165	1	Nipple, Pipe (3/4"NPT x 5-1/2"Lg)
5	505-0132	1	Elbow, Pipe - 90 Deg (3/4"NPT)
6	505-0102	1	Nipple, Pipe - Close (3/4"NPT x 1-3/8"Lg)
7	110-0067	2	Nut, Hex (7/16-20)
8	850-0055	2	Washer, Lock - Spring (7/16")
9	#	2	Stud
10	#	1	Gasket
11	#	1	Carburetor, Gas Vapor
12	800-0028	2	Screw, Cap - Hex Head (5/16-18 x 1")
13	850-0045	2	Washer, Lock - Spring (5/16")
14	#	1	Cover Plate
15	#	1	Gasket

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
16	<b>VALVE, SOLENOID - GASEOUS FUEL (Medium Pressure)</b>		
	307-0836	1	1"NPT, 12 VDC, 25 PSI
	307-0865	1	1"NPT, 24 VDC, 25 PSI
	307-0837	1	1-1/4"NPT, 12 VDC, 25 PSI
	307-0866	1	1-1/4"NPT, 24 VDC, 25 PSI
	307-0840	1	2"NPT, 12 VDC, 15 PSI
	307-0841	1	2"NPT, 24 VDC, 15 PSI
17	<b>STRAINER - GASEOUS FUEL (Select as applicable)</b>		
	149-0752	1	1"NPT
	149-0624	1	1-1/4"NPT
	149-0751	1	2"NPT
	149-1241	1	3"NPT
18	<b>LINE, FUEL - WATER, GAS/GASO (Select as applicable)</b>		
	(NOTE: Not for use with LPG Liquid)		
	503-0273	1	1"NPT x 12"Lg
	503-0430	1	1-1/4"NPT x 13"Lg
	503-0331	1	1-1/2"NPT x 14"Lg
	503-0372	1	2"NPT x 18"Lg
	503-0577	1	2-1/2"NPT x 18"Lg
	503-0703	1	3"NPT x 24"Lg
	503-0704	1	3-1/2"NPT x 24"Lg

# - For replacement refer to Engine Manufacturer

# **OPTIONAL FUEL SYSTEM (LPG LIQUID)**

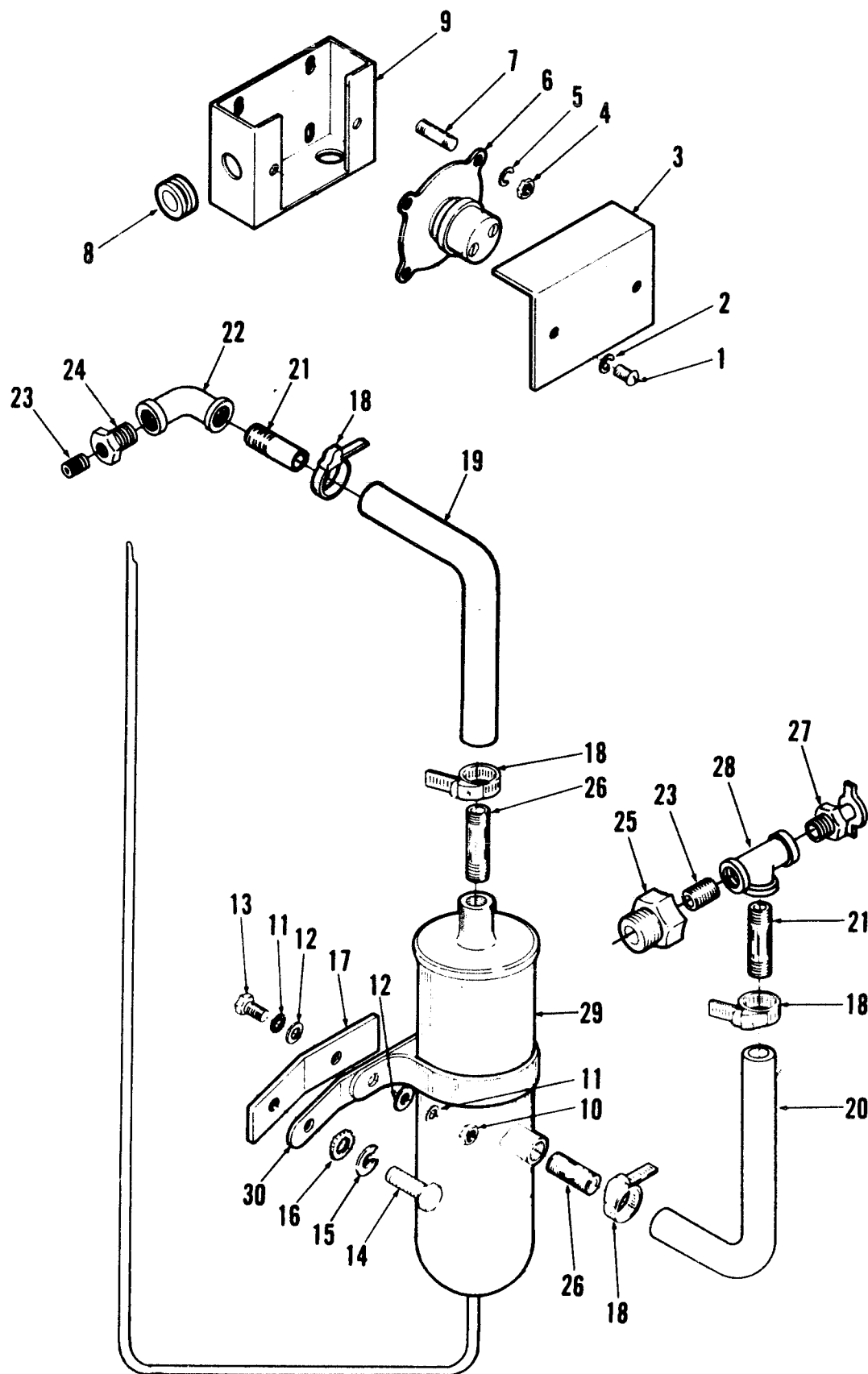


# OPTIONAL FUEL SYSTEM (LPG LIQUID)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
TYPICAL FUEL SYSTEM (LPG Vapor)			
1	503-0183	4	Clamp, Hose
2	503-1169	2	Hose, Rubber (5/8" ID x 48" Lg)
3	502-0787	2	Adapter, Hose to Pipe, 90 Deg (3/8"NPT x 5/8" Hose)
4	148-0625	1	Converter/Regulator - LPG Gas (1-1/2 PSI Output) (1/4"NPT x 1"NPT)
5	NIPPLE, PIPE (Select as applicable)		
	505-0086	1	1"NPT x 2-1/2"Lg
	505-0087	1	1"NPT x 3"Lg
	505-0088	1	1"NPT x 4-1/2"Lg
	505-0089	1	1"NPT x 5"Lg
	505-0090	1	1"NPT x 6"Lg
6	505-0023	1	Bushing, Reducer - Hex (1-1/4"NPT x 1"NPT)
7	148-0635	1	Regulator, Pressure - LPG Vapor (1-1/4"NPT)
8	505-0023	2	Bushing, Reducer - Hex (1-1/4"NPT x 1"NPT)
9	505-0004	2	Nipple, Pipe - Close (1"NPT x 1-1/2")
10	307-1041	1	Valve, Solenoid - Gaseous Fuel, Low Pressure (1"NPT, 12 VDC, 1/2 PSI)
11	505-0751	1	Elbow, Pipe - Reducing, 90 Deg (1-1/4"NPT x 3/4"NPT)
12	505-0165	1	Nipple, Pipe (3/4"NPT x 5-1/2"Lg)
13	505-0132	1	Elbow, Pipe - 90 Deg (3/4"NPT)
14	505-0102	1	Nipple, Pipe - Close (3/4"NPT x 1-3/8"Lg)
15	110-0067	2	Nut, Hex (7/16-20)
16	850-0055	2	Washer, Lock - Spring (7/16")
17	#	2	Stud
18	#	1	Gasket
19	#	1	Carburetor, Gas Vapor
20	800-0028	2	Screw, Cap - Hex Head (5/16-18 x 1")
21	850-0045	2	Washer, Lock - Spring (5/16")
22	#	1	Cover Plate
23	#	1	Gasket
24	148-0367	1	Switch, Control - Vacuum (12 VDC)
25	502-0098	1	Nipple, Pipe - Close (1/8"NPT x 3/4"Lg)
26	505-0016	1	Bushing, Reducer - Hex (3/8"NPT x 1/8"NPT)
27	VALVE, SOLENOID - GASEOUS FUEL (Medium Pressure)		
	307-0836	1	1"NPT, 12 VDC, 25 PSI
	307-0865	1	1"NPT, 24 VDC, 25 PSI
	307-0837	1	1-1/4"NPT, 12 VDC, 25 PSI
	307-0866	1	1-1/4"NPT, 24 VDC, 25 PSI
	307-0840	1	2"NPT, 12 VDC, 15 PSI
	307-0841	1	2"NPT, 24 VDC, 15 PSI
28	STRAINER - GASEOUS FUEL (Select as applicable)		
	149-0752	1	1"NPT
	149-0624	1	1-1/4"NPT
	149-0751	1	2"NPT
	149-1241	1	3"NPT
29	LINE, FUEL - WATER, GAS/GASO (Select as applicable) (NOTE: Not for use with LPG Liquid)		
	503-0273	1	1"NPT x 12"Lg
	503-0430	1	1-1/4"NPT x 13"Lg
	503-0331	1	1-1/2"NPT x 14"Lg
	503-0372	1	2"NPT x 18"Lg
	503-0577	1	2-1/2"NPT x 18"Lg
	503-0703	1	3"NPT x 24"Lg
30	307-0268	1	Valve, Solenoid - Liquid Fuel (1/4"NPT, 12 VDC, 300 PSI)

# - For replacement refer to Engine Manufacturer.

# **OPTIONAL ENGINE COOLANT HEATER (VERTICAL TANK)**

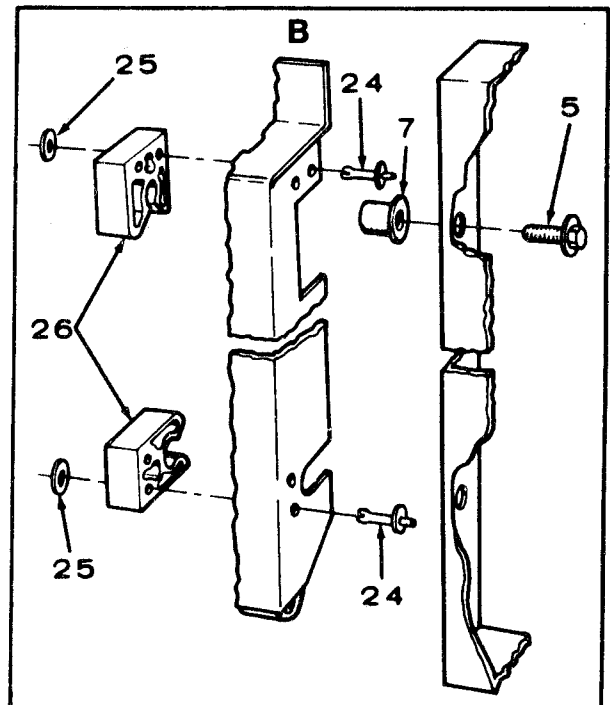
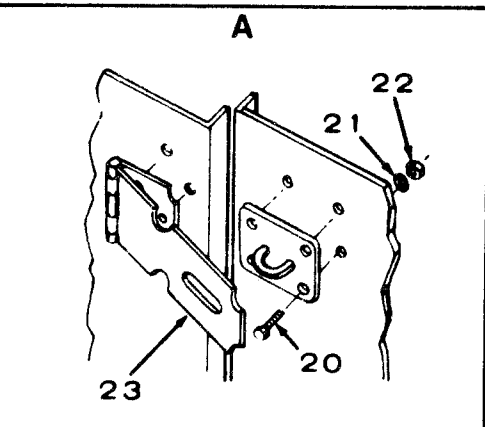
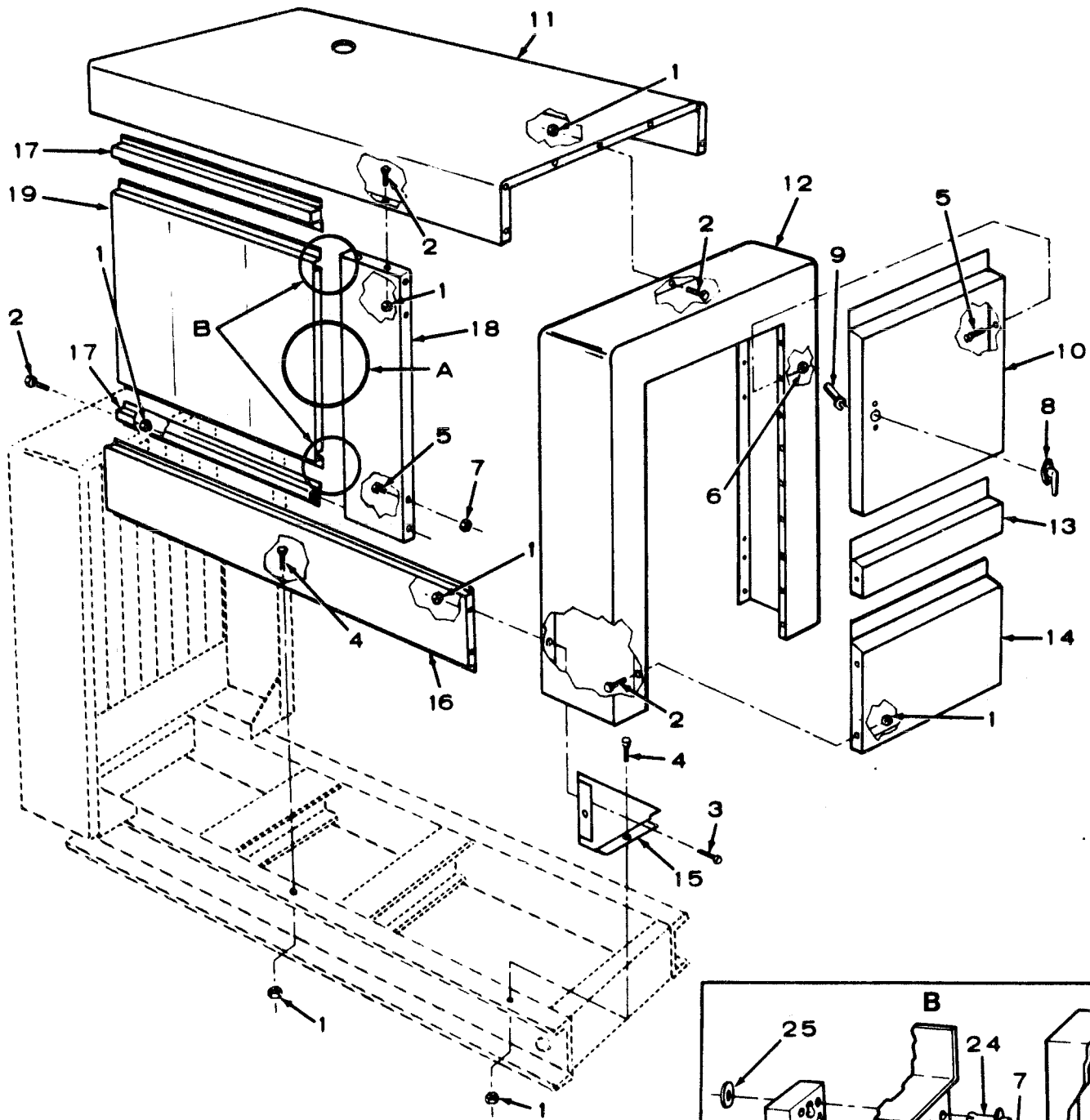


# OPTIONAL ENGINE COOLANT HEATER (VERTICAL TANK)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
ENGINE COOLANT HEATERS			
		1	120 Volt, 1500 Watts
		1	120 Volt, 2000 Watts
		1	208/240 Volt, 1875-2000 Watts
1	812-0076	2	Screw, Machine - Round Head (#8-32 x 5/16")
2	850-0025	2	Washer, Lock - Spring (#8)
3	COVER, THERMOSTAT BOX		
	333-0013	1	Used on 120 Volt Applications
	333-0056	1	Used on 240 Volt Applications
4	870-0053	2	Nut, Hex (#10-32)
5	850-0030	2	Washer, Lock - Spring (#10)
6	SWITCH, THERMOSTATIC		
	309-0106	1	120 Volt, 25 Amp, SPST (120 Deg Close, 130 Deg Open)
	309-0256	1	120/250 Volt, 40-25 Amp, DPST (100 Deg Close, 130 Deg Open)
7	STUD		
	520-0446	2	#10-32 x 3/4"
	520-0672	2	#10-32 x 1"
8	508-0008	2	Grommet, Rubber
9	BOX, THERMOSTAT		
	333-0012	1	Used on 120 Volt Applications
	333-0057	1	Used on 208/240 Volt Applications
10	862-0015	1	Nut, Hex (5/16-18)
11	856-0008	2	Washer, Lock - EIT (5/16")
12	526-0115	2	Washer, Flat (11/32"ID x 11/16"OD x 1/16"Thk)
13	800-0031	1	Screw, Cap - Hex Head (5/16-18 x 1-1/2")
14	800-0050	1	Screw, Cap - Hex Head (3/8-16 x 1")
15	850-0050	1	Washer, Lock - Spring (3/8")
16	856-0010	1	Washer, Lock - EIT (3/8")
17	130-0755	1	Bracket, Mounting - Heater
18	503-0183	4	Clamp, Hose
19	503-0912	1	Hose, Rubber (5/8"ID x 61/64"OD x 17"Lg)
20	503-1012	1	Hose, Rubber (5/8"ID x 61/64"OD x 27"Lg)
21	505-0135	2	Nipple, Pipe - Half (3/8"NPT x 1-1/2"Lg)
22	505-0039	1	Elbow, Pipe - 90 Deg (3/8"NPT)
23	505-0101	2	Nipple, Pipe - Close (3/8"NPT x 1"Lg)
24	505-0019	1	Bushing, Reducer - Hex (1/2"NPT x 3/8"NPT)
25	505-0131	1	Bushing, Reducer - Hex (3/4"NPT x 3/8"NPT)
26	505-0135	2	+Nipple, Pipe - Half (3/8"NPT x 1-1/2"Lg)
27	504-0028	1	Cock, Drain (3/8"NPT)
28	505-0060	1	Tee, Pipe (3/8"NPT)
29	HEATER, ENGINE COOLANT (Includes Mounting Strap)		
	333-0052	1	1500 Watts, 120 Volt
	333-0053	1	2000 Watts, 120 Volt
	333-0073	1	2000 Watts, 208/240 Volt
30		1	Strap, Mounting (Part of Heater)

+ - Parts used with 2000 Watt Heaters only.

# OPTIONAL SET HOUSING

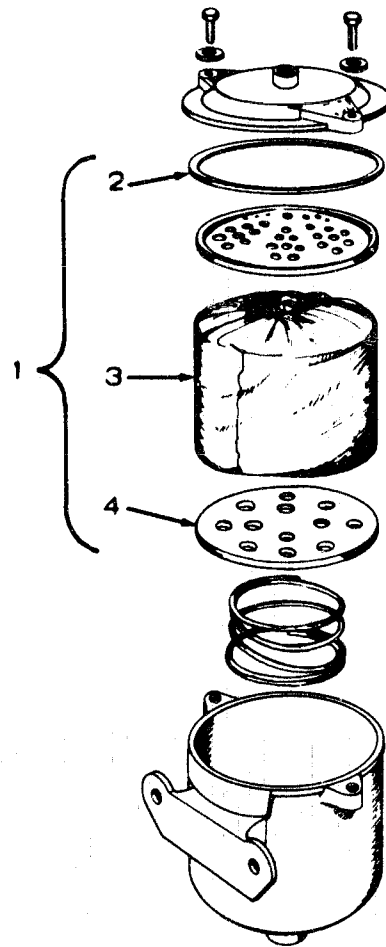


## OPTIONAL SET HOUSING

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	870-0257	62	Nut, Hex (5/16-18)
2	821-0014	48	Screw, Cap - Locking Head (5/16-18 x 1/2")
3	821-0016	14	Screw, Cap - Locking Head (5/16-18 x 3/4")
4	800-0030	14	Screw, Cap - Hex Head (5/16-18 x 1-1/4")
5	821-0010	20	Screw, Cap - Locking Head (1/4-20)
6	870-0212	4	Nut, Hex (1/4-20)
7	870-0258	16	Nut, Weld - Door Mounting
8	406-0157	1	Handle, Lock
9	406-0089	1	Catch
10	405-1871	1	Door, Rear
11	PANEL, TOP - HOUSING		
	405-1885	1	Begin Spec F thru H
	405-1919	1	Begin Spec J (Water Cooled Manifold)
	405-2163	1	Begin Spec J (Dry Manifold)
12	405-1864	1	Panel, Rear
13	405-1858	2	Panel, Rear Louver
14	405-1856	1	Panel, Lower Rear Housing
15	BRACKET, PANEL MOUNTING		
	405-2016	4	Begin Spec J
	405-1854	4	Spec F thru H
16	PANEL, BASE		
	405-2162	2	Begin Spec J
	405-1860	2	Spec F thru H
17	405-1859	8	Panel, Louver
18	PANEL, CENTER		
	405-2173	2	Begin Spec J
	405-1862	2	Spec F thru H
19	405-1861	4	Door, Removable
20	814-0079	28	Screw, Machine - Flat Head (#8-32 x 1/2")
21	850-0025	28	Washer, Lock - Spring (#8)
22	860-0008	28	Nut, Hex (#8-32)
23	406-0249	4	Hasp Set - Optional
24	818-0150	32	Rivet, Drive Pin
25	526-0003	32	Washer, Flat (11/64"ID x 3/8"OD x 1/32"Thk)
26	405-1872	16	Clip, Door - Plastic



# **OPTIONAL ENGINE COOLANT FILTER ASSEMBLY**

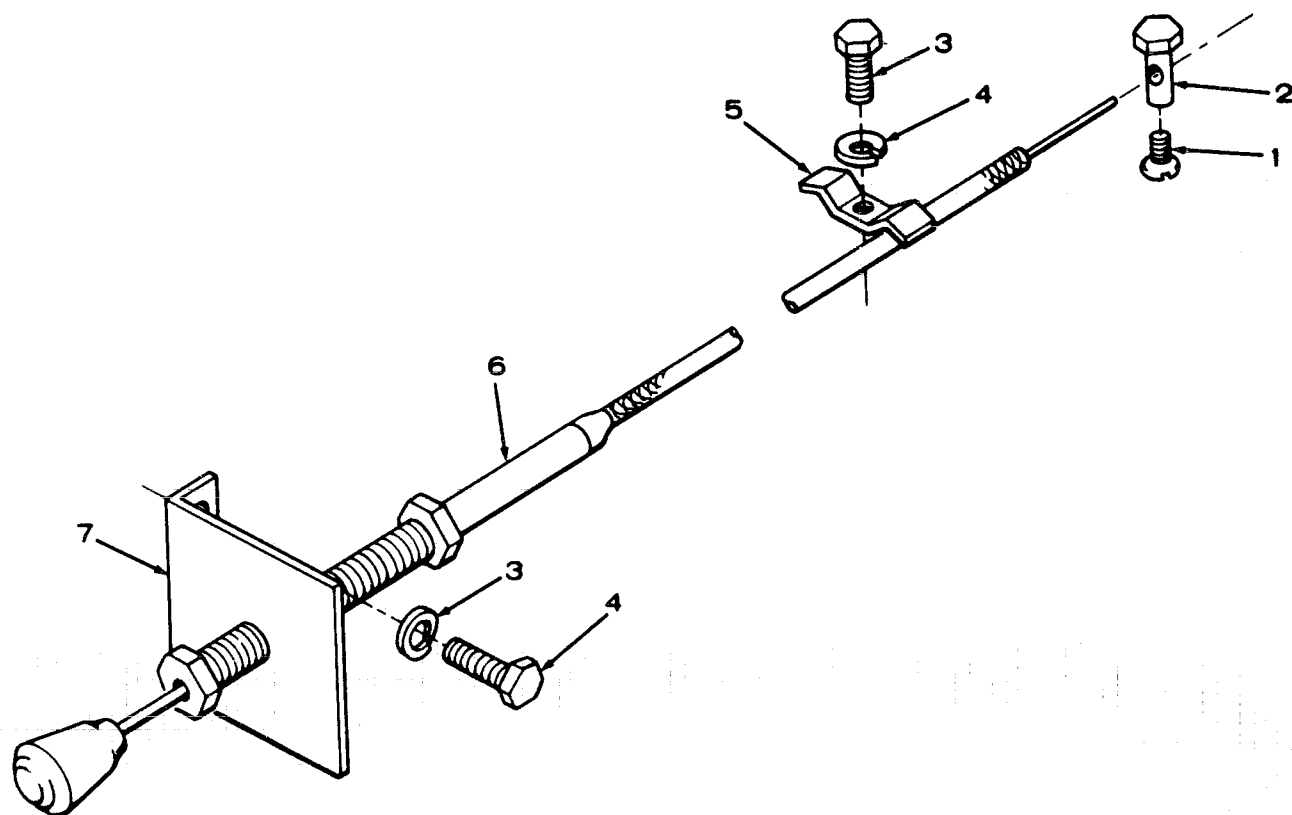


CS-1059

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	FILTER ASSEMBLY, ENGINE COOLANT		
	130-0462	1	15 to 30 Gallon Capacity (Replacement Items Marked £)
	130-0497	1	5 to 10 Gallon Capacity (Replacement Items Marked †)
1	KIT REPLACEMENT - FILTER (Includes Items 2 Thru 4)		
	130-0769	1	£Original Equipment (Water Coolant)
	130-0770	1	£Special (Perm. Anti-Freeze Coolant)
	130-0771	1	†Original Equipment (Water Coolant)
	130-0772	1	†Special (Perm. Anti-Freeze Coolant)
2	GASKET, COVER		
	130-0777	1	£
	130-0778	1	†
3	ELEMENT, FILTER		
	130-0773	1	£Chromate (Water Coolant)
	130-0774	1	£Special (Perm. Anti-Freeze Coolant)
4	PLATE, SACRIFICIAL		
	130-0779	1	£
	130-0780	1	†

£ - **NOTE:** Used on 130-0462 Filter Assembly.  
† - **NOTE:** Used on 130-0497 Filter Assembly.

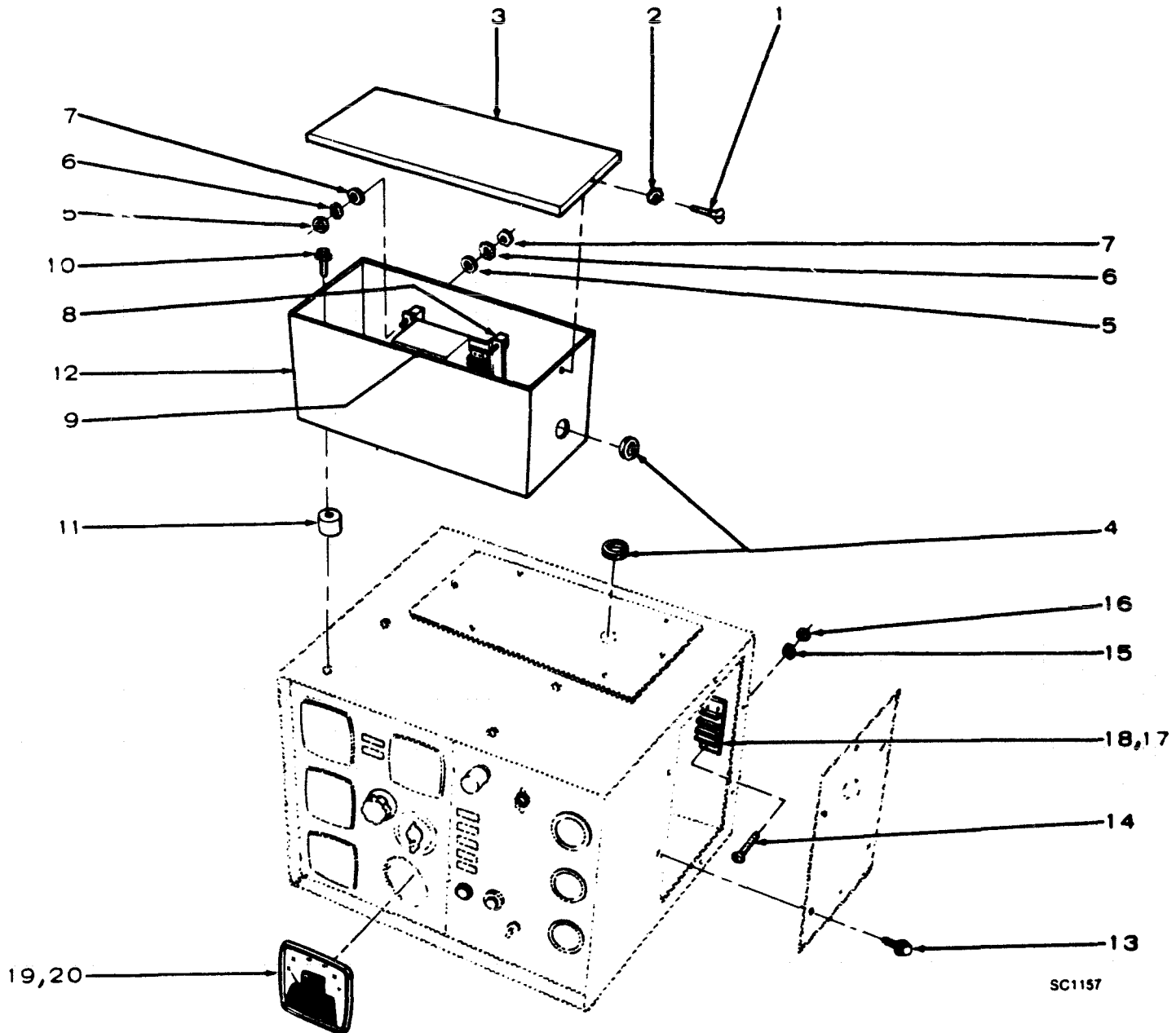
# **OPTIONAL VERNIER THROTTLE**



M-1179

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	812-0075	1	Screw, Machine - Round Head (#8-32 x 1/4")
2	152-0158	1	Swivel
3	800-0005	3	Screw, Cap - Hex Head (1/4-20 x 3/4")
4	850-0040	3	Washer, Lock - Spring (1/4")
5	152-0036	1	Clamp, Holddown - Cable
6	152-0120	1	Throttle Control - Vernier
7	151-0230	1	Bracket, Mounting - Throttle Control

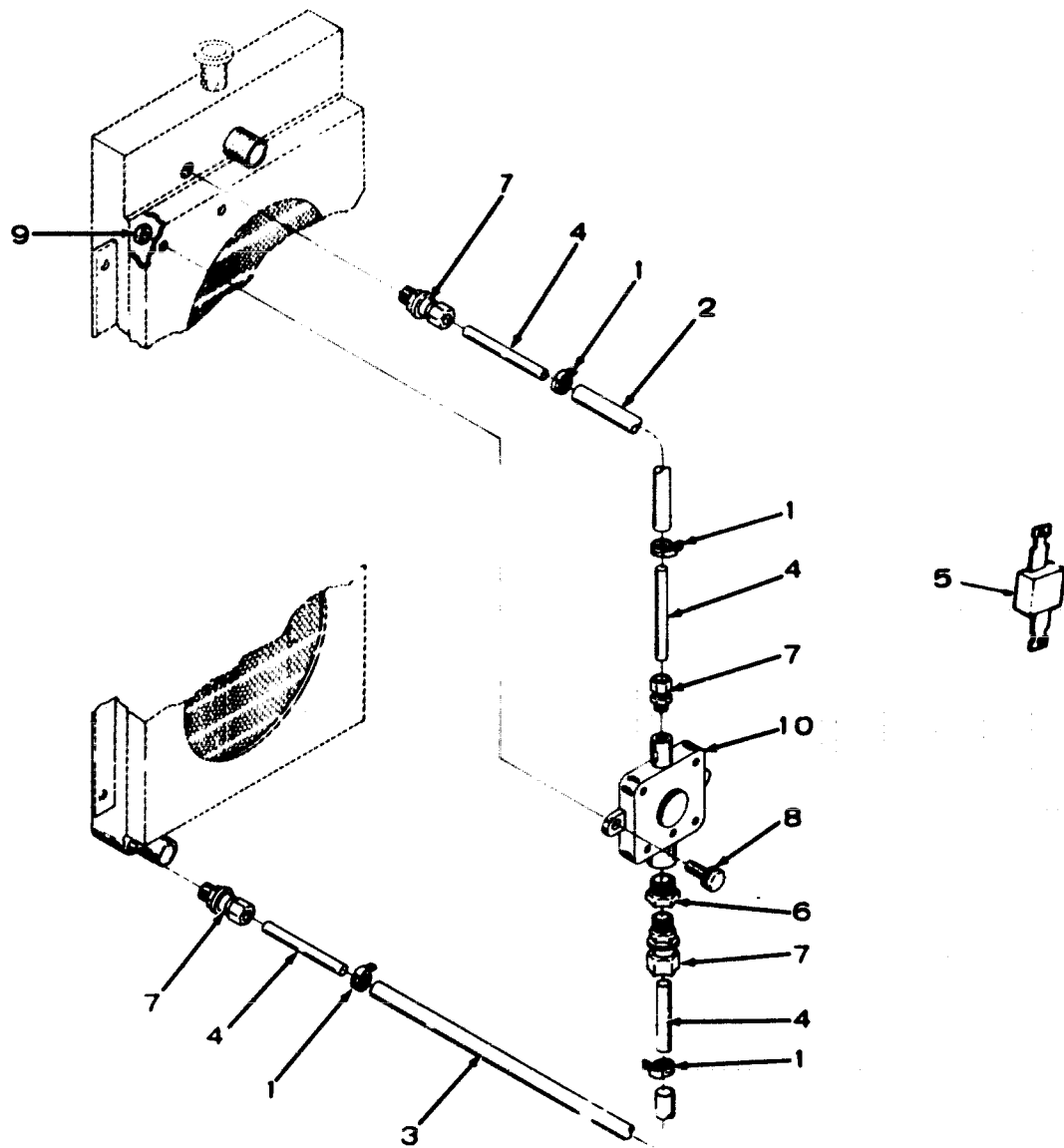
# OPTIONAL WATTMETER



SC1157

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	815-0026	2	Screw, Machine - Truss Head (#10-32 x 3/8")	15	853-0003	4	Washer, Lock - External Tooth (#6)
2	853-0008	2	Washer, Lock - External Tooth (#10)	16	860-0006	4	Nut, Hex (#6-32)
3	301-3476	1	Cover - Transducer Box	17	332-0609	1	Terminal, Strip
4	508-0001	2	Grommet, Rubber (1-1/6" OD)	18	332-0610	1	Marker, Strip
5	860-0008	8	Nut, Hex (#8-32)	19	302-1102	1	Wattmeter (Less Replaceable Dial)
6	853-0005	8	Washer, Lock - External Tooth (#8)	20	DIAL, WATTMETER (Select as Required)		
7	526-0003	8	Washer, Flat (11/64" ID x 3/8" OD x 1/32" Thk)	302-1103	1	Scale 0-35 kW	
8	402-0354	4	Mount, Vibration	302-1104	1	Scale 0-50 kW	
9	TRANSDUCER (Select as Required)			302-1105	1	Scale 0-70 kW	
	302-1082	1	60 Hertz	302-1106	1	Scale 0-90 kW	
	302-1083	1	50 Hertz	302-1107	1	Scale 0-115 kW	
10	821-0014	8	Screw, Self-locking - Hex Washer Head (5/16-18 x 1/2")	302-1108	1	Scale 0-160 kW	
11	402-0070	4	Mount, Vibration	302-1109	1	Scale 0-180 kW	
12	301-3477	1	Box, Transducer	302-1110	1	Scale 0-200 kW	
13	815-0350	6	Screw, Tapping - Hex Washer Head (#10-32 x 3/8")	302-1115	1	Scale 0-250 kW	
14	812-0063	4	Screw, Machine - Round Head (#6-32 x 1/2")	302-1116	1	Scale 0-300 kW	
				302-1117	1	Scale 0-350 kW	
				302-1118	1	Scale 0-400 kW	
				302-1119	1	Scale 0-450 kW	
				302-1120	1	Scale 0-550 kW	
				302-1121	1	Scale 0-650 kW	
				302-1122	1	Scale 0-750 kW	

## OPTIONAL LOW COOLANT LEVEL SWITCH



CS-1148

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	503-0685	4	Clamp, Hose	6	502-0802	1	Bushing, Reducer - Brass (1/2" NPT x 1" NPT)
2	503-0707	1	Hose, Vinyl (1/4" OD x 12" Lg)	7	502-0801	4	Connector, Tube - Brass (1/4" NPT x 1/4" Tube)
3	503-1119	1	Hose, Vinyl (1/4" ID x 60" Lg)	8	821-0011	2	Screw, Self-Locking - Hex Washer Head (1/4-20 x 7/8")
4	130-2053	4	Tube (1/4" OD x 2" Lg)	9	870-0212	2	Nut, Self-Locking - Hex Washer Head (1/4-20)
5	357-0030	2	Diode, Rectifier	10	193-0329	1	Switch - Coolant Level